

STUDIES IN THE ORTHOPTEROUS FAMILY PHASMIDÆ.

BY JAMES A. G. REHN.

The material treated in the following pages is almost wholly from the collections of the Academy, the U. S. National Museum, and the collection of Mr. Morgan Hebard, of Chestnut Hill, Philadelphia.

The localities represented by large series are as follows:

Costa Rica (various localities). Schild and Burgdorf collection. [U. S. N. M.]

Mombasa, East Africa. [Collection of Morgan Hebard.]

South Africa. [A. N. S. Phila.]

Trong, Lower Siam. Dr. W. L. Abbott. [U. S. N. M.]

Goenong Soegi, Sumatra. A. C. Harrison, Jr., and Dr. H. M. Hiller. [A. N. S. Phila.]

Obi, Moluccas. [Collection of Morgan Hebard.]

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Subfamily LONCHODINÆ.

Genus **MYRONIDES** Stål.

1875. *Myronides* Stål, *Recensio Orthopterorum*, III, pp. 8 and 63.

Included *M. pfeifferæ* (Westwood) and *M. kaupii* Stål, of which the former may be considered the type.

Myronides ashmeadi n. sp.

Type.—♂; Trong, Lower Siam. (W. L. Abbott.) [Cat. No. 6,974, U. S. N. M.]

Apparently related to *M. filum* Sharp¹ from New Britain, but readily separated by the absence of pronounced cephalic and metathoracic tubercles, the comparatively greater length of the limbs, and the single tooth on the apical portion of the femora.

I take pleasure in dedicating this very distinct species to my friend, Dr. William H. Ashmead, of the United States National Museum, as a token of personal esteem and regard for his pronounced scientific ability.

¹ Willey's *Zoological Results*, Part I, p. 81, Pl. VII, fig. 1.

Form very slender. Head moderately elongate, subequal; eyes subovate, projecting considerably beyond the head; antennæ with the basal joint longer than broad, depressed, subequal in width. Pronotum about twice as long as broad. Mesonotum very elongate, subequal, surface with but few small tubercles. Metanotum (with median segment) not quite three-fifths the length of the mesonotum; median segment about two-fifths the metathoracic length. Abdomen slender, elongate, exceeding the thoracic segments in length; ninth dorsal segment tectate, compressed, apex very deeply and narrowly emarginate; supra-anal plate not visible; cerci of moderate length, subequal, incurved; subgenital plate short, not extending beyond the base of the supra-anal, apex very broadly and evenly rounded. Limbs very slender, the anterior and posterior pair subequal in length, median pair shorter. Anterior femora equal to the pronotum, mesonotum and metanotum (without median segment) in length, depressed, rectangular in section, supplied with a median subbasal dentiform process on the inferior surface; tibiæ very slightly exceeding the femora in length, subtrigonal in section; metatarsi about equal to the remaining tarsal joints in length. Median femora slightly exceeding the mesonotum in length, subtrigonal in section, inferior surface with a median subbasal process as on the anterior femora, genicular lobes acute; tibiæ very slightly exceeding the femora in length, subtrigonal in section. Posterior femora slightly exceeding the middle of the fourth abdominal segment,² sectionally subquadrate, the usual subbasal process present; tibiæ exceeding the femora by about the length of the median segment, sectionally subtrigonal; metatarsi equal to the remaining tarsal joints in length.

General color dull brownish-green, becoming rather pale green on the limbs; head, antennæ, pronotum, under surface of the abdominal segments, and the genicular regions very dull obscure elaret. Pubescence on the tarsal joints golden yellow.

Measurements.

Total length,	71 mm.
Length of pronotum,	3.5 "
Length of mesonotum,	16.5 "
Length of metanotum (with median segment),	9 "
Length of abdomen,	38.5 "
Length of anterior femora,	23.5 "
Length of anterior tibiæ,	25.5 "
Length of median femora,	16.5 "
Length of posterior femora,	23 "

² Not including the median segment.

Two additional male specimens have been examined, one a topotype, the other from Khow Sai Dow, Trong, 1,000 feet elevation, taken in 1899.

Myronides porus (Westwood)?

1859. *Lonchodes Porus* Westwood, Cat. Orth. Ins. Brit. Mus., I, p. 42, Pl. VII, fig. 9. [East Indies.]

One female; Khow Sai Dow, Trong, Lower Siam, 1,000 feet. January–February, 1899. (Dr. W. L. Abbott.) [U. S. N. M.]

While the female of this species has never been described, the present specimen is in such condition that the more important characters cannot be critically examined. For this reason some uncertainty exists as to the correctness of the determination.

Genus **PHRAORTES** Stål.

1875. *Phraortes* Stål, Recensio Orthopterorum, III, pp. 8 and 64.

Type.—*Phasma elongata* Thunberg.

Phraortes mikado n. sp.

Type.—♀; Yokohama, Japan. (Loomis.) [A. N. Caudell.]

Allied to *P. elongatus* (Thunberg) (= *Phasma niponense* De Haan), but differing in the character of the lamellar expansions on the median and posterior femora, the carination of the anterior femora, and the non-gibbous sixth abdominal segment.

Form slender, elongate. Head moderately long, considerably wider anteriorly than posteriorly; eyes circular, moderately prominent; occiput bearing a pair of acute conical spines, equal in height to the depth of the eye. Pronotum rectangular, longer than broad, surface with slightly marked longitudinal and transverse depressions. Mesonotum over four times the length of the pronotum, subequal except posteriorly, median longitudinal depression well marked. Metanotum (with median segment) about four-fifths the length of the mesonotum, subequal except for the gradually expanded posterior portion, median segment about one-fourth the length of the metanotum alone. Abdomen considerably exceeding the head and thoracic segments in length, the greatest width being at the third and fourth segments; ninth dorsal segment tectate, carinate, lateral margins sinuate, the apex with a median triangular emargination which exposes the truncate extremity of the tectate and carinate supra-anal plate; subgenital plate scoop-shaped, compressed, carinate. Limbs very slender, the anterior pair exceeding the others in length. Anterior femora exceeding, by more than the length of the median segment, the combined length of the head, pronotum and mesonotum, subtrigonal in section, superior ex-

ternal and inferior margin sparsely serrulate, lower surface with a carina which is internal proximally but median distally; tibiæ exceeding the length of the femora by over the length of the head, pentagonal in section. Median femora comparatively short, not quite equal to the length of the mesonotum, subtrigonal in section, the superior surface narrowly flattened, lower margins slightly expanded basally and provided with several dentiform serrations, lower surface with the weak median carina elevated apically and bearing several rather slight dentiform processes, genicular lobes acute. Posterior femora considerably exceeding the pronotum and mesonotum in length, general structure identical with that of the median femora except that the external inferior margin alone is expanded and developed into but one dentiform serration; tibiæ slightly exceeding the femora in length, pentagonal in section, median inferior carina evenly elevated in the proximal portion.

General color greenish-brown, paler anteriorly and posteriorly.

Measurements.

Total length,	104.5 mm.
Length of pronotum,	3.5 "
Length of mesonotum,	21 "
Length of metanotum (with median segment),	17 "
Length of abdomen,	57 "
Length of anterior femora,	32 "
Length of anterior tibiæ,	38 "
Length of median femora,	20 "
Length of posterior femora,	25.5 "

Genus **DIXIPPUS** Stål.

1875. *Dixippus* Stål, Recensio Orthopterorum, III, pp. 9 and 66.

Included *crawangensis* (Haan), *nodosus* (Haan), and *uniformis* (Westwood), of which the first may be selected as the type.

Dixippus sumatranus (Haan).

1842. *P[hasma] sumatranum* Haan, Natuur. Gesch. Neder. Overzeesche Bezitt., Plaatn, tab. 13, fig. 6. [Batang Singalang, Sumatra.]

One male; Goenong Soegi, Lampong, Sumatra. (A. C. Harrison, Jr., and Dr. H. M. Hiller.) [A. N. S. Phila.]

As Kirby has shown,³ this form is no doubt distinct from *nodosus*, with which Haan confused it in his text, after having separated and applied a name to it on his plate. Kirby's male specimen and the one before me carry out the characters of the female figured by Haan, and

³ *Trans. Linn. Soc. London, zool. ser., VI, 2d ser., pp. 458, 459.*

accordingly prove that the very different looking *nodosus* is something quite distinct.

The male specimens from Baram, North Borneo examined by Kirby, may prove to be a closely allied but distinct species, as the measurements given are very much larger than those of the Sumatran individual examined. The dimensions of the Goenong Soegi specimen are as follows:

Total length,	66	mm.
Length of pronotum,	2.7	"
Length of mesonotum,	16	"
Length of metanotum (with median segment),	13	"
Length of abdomen,	33	"
Length of anterior femora (approximately),	13	"
Length of anterior tibiae,	12	"
Length of median femora,	9	"
Length of posterior femora,	11	"

Dixippus uniformis (Westwood).

1848. *Phasma (Lonchodes) uniforme* Westwood, Cabinet Orient. Entom., Pl. XXXIX, fig. 3. [Prince of Wales' Island, Malacca.]

One male; Khow Sai Dow, Trong, Lower Siam, 1,000 feet elevation. January–February, 1899. (Dr. W. L. Abbott.) [U. S. N. M.]

This specimen has the mesothorax and the metathorax each with a broad median transverse band of rich grass green.

The distribution of the species is supposed to cover Malacca, Sarawak and Amboina or Ceram.

Genus **CARAUSIUS** Stål.

1875. *Carausius* Stål, Recensio Orthopterorum, III, pp. 8 and 64.

Included *C. strumosus* and *C. macer* Stål, of which the former may be considered the type.

Carausius braccatus n. sp.

Type.—♀; Trong, Lower Siam. (Dr. W. L. Abbott.) [Cat. No. 6,979, U. S. N. M.]

Apparently not closely allied to any of the previously known species of the genus.

Size rather large; form elongate, subequal; surface of the head and body nodulose. Head subequal in width; interspace between the eyes bearing a transverse fold, which is crossed by a slight median longitudinal sulcus, and developed into slight elevations laterally; posterior part of the head with four slight transversely disposed tubercles; eyes circular, moderately prominent; antennæ with

the first joint depressed, elongate-ovate in outline, second joint moniliform and about one-third the length of the first. Pronotum about a third again as long as broad; posterior margin arcuate; median transverse sulcus arcuate, longitudinal sulcus much less distinct. Mesonotum about four and one-half times the length of the pronotum, subequal in width (except at the posterior articular portion). Metanotum (with median segment) about twice the length of the head and pronotum; median segment equal to one-half of the metanotum alone. Abdomen exceeding the head and thoracic segments in length, subequal in width, apical segments with a median longitudinal carina, which become more distinct as the apex is approached; ninth dorsal segment apparently tectate in life,⁴ apex slightly sinuate; supra-anal plate produced, acuminate, tectate, the apex triangularly emarginate; subgenital plate rugulose, carinate, apex with a distinct finger-like median process. Limbs of moderate length, all compressed, the anterior pair exceeding the others in size. Anterior femora slightly over twice the length of the head and pronotum, compressed trigonal in section, each margin with a foliaceous carinate ridge, lower surface with the median carina prominent proximally, and bearing several dentiform serrations distally; tibiæ equal to the femora in length, strongly compressed, the dorsal portion bearing a marked foliaceous ridge, inferior surface widely and deeply sulcate; metatarsi equal to the remaining tarsal joints in length, superior portion strongly cristate; remaining tarsal joints small, the apical one equal to the second and third in length. Median femora equal to about two-thirds the length of the mesonotum, compressed, dorsal portion strongly carinate; tibiæ equal to the femora in length, pentagonal in section, external inferior carina with a basal arcuate expansion; metatarsi equal to the second, third and fourth tarsal joints together, dorsal surface not expanded. Posterior femora two-thirds the length of the mesonotum, compressed, dorsal aspect carinate, genicular lobes subacuminate, internal inferior carina apically expanded and bearing three distinct teeth; tibiæ equal to the metanotum and median segment in length, pentagonal in section, dorsal surface sulcate, basal portion of the inferior median and the apical portion of the dorsal carina roundly expanded; metatarsi but slightly longer than the terminal tarsal joint, dorsal surface not crested.

General color red-brown, becoming dull umber on the limbs and ashy-brown on the head.

⁴ Distorted in the dried specimen.

Measurements.

Total length,	125.5 mm.
Length of pronotum,	6 "
Length of mesonotum,	28 "
Length of metanotum (with median segment),	22 "
Length of abdomen,	65 "
Length of anterior femora,	24 "
Length of anterior tibiæ,	24.2 "
Length of median femora,	18 "
Length of posterior femora,	20 "

***Carausius mammatus* n. sp.**

Type.—♀; Island of Obi, Moluccas. [A. N. S. Phila., presented by Mr. Morgan Hebard.]

This new and interesting form exhibits some relationship with *C. mercurius* Stål,⁵ from an unknown locality, but differs in the form of the apical segments of the abdomen and the character of the expansion of the anterior tibiæ. Kirby's *Dixippus* (?) *insularis*⁶ from Thursday Island appears to be related to the new form, but can be separated by a number of characters.

Size rather large; form moderately slender; surface evenly rugulose. Head slightly contracted posteriorly; interocular region with a transverse ridge, incised centrally and laterally developed into acute erect dentiform processes; eyes rather small, subovate; tubercles on the posterior half of the head arranged in distinct longitudinal series; antennæ not quite equal to half the length of the body, the basal joint depressed, subovate, expanded, second joint half the length of the first. Pronotum subequal in width, the anterior and posterior margins subtruncate, transverse median sulcus short. Mesonotum slightly expanded posteriorly, a fine median carina present and extending a considerable distance on the abdomen. Metanotum (with median segment) equal to two-thirds the length of the mesonotum, subequal in width; median segment slightly more than two-thirds the length of the metanotum alone. Abdomen with the three basal segments longitudinal, subequal in width; fourth segment with slight lateral expansions on the apical half, slightly exceeding the basal segments in width; fifth segment strongly expanded and moderately inflated, the expansion greatest on the apical portion, dorsal surface with a pair of median transversely disposed mammillate tubercles; sixth segment equal to the first in width, in length equal to the fifth, both segments being somewhat shorter than the basal ones; seventh, eighth and ninth segments

⁵ *Annales Soc. Entom. Belg.*, Comp.-rend., XX, p. lxxii.

⁶ *Trans. Linn. Soc.*, 2d ser. zool., VI, p. 460.

subequal in width, tectate, the seventh almost equal to the other two in length, apical margin with the median portion truncate; supra-anal plate moderately produced, truncate, rounded; cerci very short, hardly visible; subgenital opercule equal to the apex of the supra-anal plate in length, compressed, keeled, the posterior portion of the carina irregularly dentate. Anterior femora slightly shorter than the mesonotum in length, compressed, the superior margin considerably expanded basally and undulate, inferior external margin apically with two distinct teeth, external genicular lobes acute; anterior tibiæ about equal in length to the femora, compressed, the superior margin with a continuous foliaceous expansion which develops a slight premedian lobe; metatarsi equal in length to the remaining tarsal joint, superiorly with a foliaceous expansion equal in height to that on the tibiæ; fifth tarsal joint almost equal in length to the second to fourth inclusive. Median femora equal to the metanotum (with median segment) in length, slightly compressed, the internal inferior margin armed apically with two dentiform processes, external genicular lobes acute; median tibiæ shorter than the femora and equal to the fifth and sixth abdominal segments in length, inferior median carina with a low basal expansion, the superior carina with an apical bullate expansion of about equal height; metatarsi not equal to the length of the remaining joints, without any foliaceous expansion; fifth tarsal joint shorter than the second to fourth inclusive. Posterior femora not quite reaching the middle of the third abdominal segment, moderately compressed, sulcate above, internal genicular lobes acute, lateral inferior margins armed apically with two spines, those on the internal margin prominent; posterior tibiæ exceeding the femora and almost equal to the mesonotum in length, median inferior carina with a low elongate foliaceous expansion at the extreme base, apex with a bullate expansion similar to the median tibiæ; metatarsi about equal to the remaining tarsal joints in length, fifth tarsal joint equal to the second and third in length.

General color wood-brown, finely flecked with blackish, becoming semi-ochraceous on the anterior limbs and antennæ, the latter with regularly disposed, usually incomplete annuli of blackish.

Measurements.

Length of body,	110 mm.
Length of pronotum,	4.5 "
Length of mesonotum,	24.5 "
Length of metanotum (with median segment),	17 "
Length of median segment,	7.5 "

Measurements.

Length of abdomen,	59	mm.
Length of anterior femora,	22	"
Length of anterior tibiæ,	23	"
Length of median femora,	17	"
Length of posterior femora,	19.5	"

Carausius obiensis n. sp.

Type.—♀; Island of Obi, Moluccas. [A. N. S. Phila., presented by Mr. Morgan Hebard.]

Allied to *C. mammatus*, but differing in the non-nodose fifth abdominal segment, the absence of large spines in the head and foliaceous expansions on the anterior metatarsi.

Size medium; form elongate; surface irregularly granulose. Head rather short, subequal in width; interspace between the eyes with a few rather large granules, but no distinct spines; eyes moderately large, circular; antennæ not equal to half the length of the body, basal joint rather elongate, twice as long as broad, depressed, second joint not quite half the length of the first. Pronotum longitudinal, somewhat compressed posteriorly; anterior margin truncate, posterior broadly arcuate; median transverse sulcus short. Mesonotum slightly less than half the length of the abdomen, a median longitudinal carina present and continued to the apex of the abdomen. Metanotum (including median segment) two-thirds the length of the mesonotum; median segment two-thirds the length of the metanotum alone, anterior margin obtuse-angulate. Abdomen with supplementary lateral carinæ in the apical portion; five basal segments longitudinal, subequal in length; sixth segment slightly shorter than the fifth; seventh, eighth and ninth segments together about equal to the sixth in length, subequal in width, tectate; eighth and ninth segments transverse, each shorter than the somewhat longitudinal seventh; supra-anal plate tectate, carinate, the apical margin rounded; cerci depressed, broad, subacuminate, not equalling the apex of the supra-anal plate in length; subgenital opercule cymbiform, keeled, of moderate size, apex subacuminate but not exceeding the apex of the supra-anal plate, the median carina apically undulate. Anterior femora equal to five-sixths the length of the mesonotum, moderately compressed, superior carina slightly expanded and undulate basally, external inferior carina bearing two preapical dentiform processes; anterior tibiæ equal in length to the femora, compressed, superior carina developed into a rather low even lamellate ridge which divides apically and encloses a comparatively broad shallow sulcus, inferior median carina developed similar to the superior

carina; metatarsi equal to the remaining tarsal joints in length, but slightly dilated superiorly; fifth tarsal joint equal to the second to fourth inclusive in length. Median femora almost equal to the metanotum (with median segment) in length, external inferior margin armed apically with two dentiform processes; median tibiæ slightly shorter than the femora, apically with a slight tumidity, the inferior median carina with a low triangular basal expansion; metatarsi not quite equal to the remaining tarsal joints in length, not dilated; fifth tarsal joint about equal to the second to fourth joints inclusive. Posterior femora reaching to the base of the third abdominal segment, slightly compressed, internal inferior margin apically with two dentiform processes, internal genicular lobes spiniform; posterior tibiæ equal to five-sixths the length of the mesonotum, slightly tumid at the apex, inferior median carina with a low triangular basal lobe; metatarsi equal to the remaining tarsal joints in length, not dilated; fifth tarsal joint equal to the second and third in length.

General color ochraceous-brown streaked with wood-brown, a line of the latter tint following the central line of the body, and reinforced on the metanotum and abdomen by lateral lines of the same tint. Antennæ ochraceous with usually imperfect annuli of blackish. Limbs mottled with blackish-brown on the anterior pair, and rather solid purplish-brown on the posterior pair.

Measurements.

Length of body,	83	mm.
Length of pronotum,	3.5	“
Length of mesonotum,	19.2	“
Length of metanotum (including median segment),	13.5	“
Length of median segment,	6	“
Length of abdomen,	44.5	“
Length of anterior femora,	17	“
Length of anterior tibiæ,	17	“
Length of median femora,	12.5	“
Length of posterior femora,	14.5	“

Subfamily HETERONEMINÆ (*Bacunculinae*).

Genus **HESPEROPHASMA** Rehn.

1872. *Phantasis* Saussure, Miss. Scient. Mexiq. l'Amer. Cent., Orth., p. 188.

(Not of Thomson, 1860.)

1901. *Hesperophasma* Rehn, Canad. Entom., XXXIII, p. 271.

Type.—By selection, *Phasma planulum* Westwood.

Hesperophasma planulum (Westwood).

1859. *Phasma planulum* Westwood, Catal. Orth. Ins. Brit. Mus., I, p. 34, Pl. 1, fig. 7. [San Domingo.]

One female; no data. [A. N. S. Phila.]

Genus **CEROYS** Serville.⁷1839. *Ceroys* Serville, Orthoptères, p. 262.

Included *perfoliatus* Gray and *multispinosus* Serville, of which the former may be considered the type.

Ceroys bigibbus n. sp.

Type.—♀; Nicaragua. [Cat. No. 6,973, U. S. N. M.]

Apparently closer related to *C. rabdota* Westwood than to any other species of the genus. From this it may be separated by the spinose mesonotum, the comparatively shorter limbs, the absence of any very marked appendages to the basal abdominal segments, and the very different character of the apical segments of the abdomen.

Size medium; form rather elongate; surface rugulose, lobate and spinulose. Head longitudinal; occiput with a pair of prominent ear-like processes, the extreme posterior margin with a pair of blunt spini-form processes; eyes subspherical, moderately prominent; antennæ about equal in length to the pronotum and mesonotum, basal joint strongly depressed. Pronotum slightly longitudinal, saddle-shaped; surface strongly tuberculate, a distinct paired series extending on either side of the faint median longitudinal sulcus; anterior margin with a pair of medium size, rounded tubercles; posterior margin with a pair of very prominent spinous processes. Mesonotum about four times the length of the pronotum, somewhat constricted anteriorly, slightly expanded centrally; median portion with a pair of low transverse carini-form lobes; posterior margin with two small pairs of median rounded lobes; lateral borders with a row of low rounded fold-like tubercles. Metanotum (with median segment) two-fifths the length of the mesonotum, immediately anterior to the median segment two low rounded lobes are developed; median segment very small, not one-fifth the length of the whole segment; supra-coxal region of the metathoracic segment margined by a saw-like series of rounded lobules. Abdomen slightly exceeding the thorax in length, the six basal segments all transverse or subtransverse, each segment with the posterior margin with two median pairs of lobules; sixth dorsal segment depressed, laterally supplied with rounded foliaceous expansions; seventh and eighth segments somewhat compressed, subcarinate, the posterior margins irregularly sinuate and serrate; ninth segment strongly depressed posteriorly, tuberculate, apex with the median portion sinuate; supra-anal plate produced, convex, apex narrowly rounded; subgenital opercule reaching slightly beyond the apex of the supra-anal plate, longitudinally striate,

⁷ Stål's *Caulonia* (*Reconsilio Orthopterorum*, III, p. 74, 1875) is apparently nothing more than a synonym of Serville's genus.

lateral borders emarginate, apex rectangulate. Limbs rather short, all lobate to a greater or lesser extent. Anterior femora three times the length of the pronotum, basal flexure occupying almost half the entire femur, superior margin with an apical dentate foliaceous lobe; tibiæ about equal to the femora in length, superior margin with four rounded lobes, decreasing in size toward the apex; metatarsi short, exceeded in length by the terminal tarsal joint and about equal to the second and third together. Median femora about equal to the anterior femora in length, posterior superior margin with a large bidentate apical lobe and several smaller ones distributed between the large one and the proximal extremity, anterior superior margin with several low rounded lobules, inferior margins with several low lobules and a median bidentate apical lobe; tibiæ about equal to the femora in length, the superior margin with three lobules decreasing in size toward the apex; metatarsi as in the anterior limbs. Posterior femora equal to the four basal joints of the abdomen in length, the superior margin with three large subpyramidal lobes, the largest being bilobate and placed at the distal extremity, several small lobules are located between the larger lobes, inferior margins with several small low lobules, the apical larger than any of the others and strongly bilobate; posterior tibiæ exceeding the femora by half the length of the fifth abdominal segment, superior surface with three rounded lobules, decreasing in size toward the distal extremity; metatarsi as in the anterior limbs.

General color brownish-black, becoming reddish-brown toward the apex of the abdomen; antennæ with the three terminal segments pale ochraceous.

Measurements.

Total length,	78 mm.
Length of pronotum,	5.5 "
Length of mesonotum,	22 "
Length of metanotum (including median segment),	9.5 "
Length of median segment,	1.9 "
Length of abdomen,	39 "
Length of anterior femora,	14.8 "
Length of anterior tibiæ,	15.5 "
Length of median femora,	12.5 "
Length of posterior femora,	16 "

There is a small female specimen from Tucurrique, Costa Rica, in the U. S. National Museum collection, which resembles very much the type of *bigibbus*. A number of points of difference, however, exist, but as these conditions in the specimen may be due to immaturity. I

have provisionally determined it as this species. The following is a brief diagnosis:

Size small; form somewhat slenderer than in the type, but otherwise similar. Head with the auricular appendages very prominent, the margins sinuate, about reaching the posterior margin of the head; eyes ovate. Mesonotum with the median processes as in the type, but more pronounced; a distinct longitudinal median carina developed. Metanotum with a distinct median carina; lateral margins with distinct sinuous carinae. Abdomen as in the type, but all of the longitudinal plicae exaggerated; lateral lobes of the sixth dorsal segment not differing materially from that of the other specimen; seventh dorsal segment about equal to the sixth in length, tectate, strongly carinate; eighth and ninth segments subequal in length, supplied with a number of sinuous longitudinal rugae, the eighth apically supplied with a median pair of low rounded lobes, the ninth with the apical margin truncate; supra-anal plate moderately produced, rounded, hirsute; cerci very short, simple, not extending beyond the apical margin of the ninth dorsal abdominal segment; subgenital opercule extending slightly beyond the apex of the eighth dorsal segment, carinate, apex rectangulate; terminal ventral segment rectangulate; apex narrowly incised. Limbs as in the type but stouter.

Measurements.

Total length,	46	mm.
Length of pronotum,	3.5	"
Length of mesonotum,	12	"
Length of metanotum (with median segment),	6	"
Length of median segment,	2.1	"
Length of abdomen,	2.3	"
Length of anterior femora,	9	"
Length of anterior tibiae,	8	"
Length of median femora,	6.5	"
Length of posterior femora,	9.5	"

Genus **DIAPHEROMERA** Gray.

1835. *Diapheromera* Gray, Synops. Phasm., pp. 13 and 18.

Type.—*Diapheromera sayi* Gray = *Spectrum femoratum* Say.

Diapheromera calcarata (Burmeister).

1838. *B[acteria] (Bacunculus) calcarata* Burmeister, Handb. d. Entom. II, p. 566. [Mexico.]

Four specimens, two males and two females: Alta Mira, Tamaulipas, Mexico, June 28, 1903. (M. E. Hoag.) [A. N. S. Phila.] Guaymas, Sonora, Mexico. [U. S. N. M.]

The male of this species is, as noted by Saussure,⁸ almost identical with that of *D. femorata*, but the female can readily be distinguished by the comparatively robust limbs and short conoid cerci. The female from Alta Mira is interesting, as it possesses two short spinous interocular processes, but is in every other detail perfectly typical of the species. The male from Guaymas has the right anterior limb aborted. Saussure has recorded this species from near Tampico.

Genus **SERMYLE** Stål.⁹

1875. *Sermyle* Stål, Recensio Orthopterorum, III, pp. 23 and 76.

Type.—As restricted,¹⁰ *Acanthoderus mexicanus* Saussure.

Sermyle physconia n. sp.

Types.—♂ and ♀; Piedras Negras, Costa Rica. (Schild and Burgdorf.) [Cat. No. 6,975, U. S. N. M.]

Allied to *S. mexicana* (Saussure), but differing in the female in the reduced expansion of the fifth abdominal segment, the much longer sixth, and the less compressed seventh, eighth and ninth segments. As the male of *mexicana* has been imperfectly described, comparison is hardly possible. From *S. atolus* (Westwood) it can readily be distinguished by the smaller size and shorter genital opercule.

♂.—Size medium; form elongate; surface subglabrous. Head rather elongate, but slightly expanded anteriorly; interspace between the eyes with a pair of erect dentiform tubercles; eyes subcircular, decidedly prominent; antennæ over twice the length of the anterior femora, basal joint depressed. Pronotum longitudinal, over half again as long as broad, median transverse sulcus deeply impressed. Mesonotum slender, two and a half times the length of the head and pronotum together, subequal (except posteriorly), rounded. Metanotum (with median segment) equal to three-fourths the length of the mesonotum, similar in shape to the mesonotum but more robust; median segment subquadrate, equal to one-fifth the length of the metanotum alone. Abdomen slender, elongate, all segments longitudinal; seventh segment compressed, but apically dilated; eighth segment slightly longitudinal, apically compressed, practically fused with the seventh; ninth segment slightly over half the length of the seventh, bullate, moderately expanded, apical margin with a comparatively deep median

⁸ *Miss. Scientifq. Mexiq.*, Orth., p. 165.

⁹ The genus *Pseudosermyle*, created by Caudell (*Proc. U. S. Nat. Mus.*, XXVI, p. 867), includes the forms having trifid cerci in the male. The Mexican *Bacteria tridens* Burmeister is accordingly a member of the genus *Pseudosermyle*. No such foliaceous lobes are developed in this genus as are found in true *Sermyle*.

¹⁰ *Vide* Caudell, *Proc. U. S. Nat. Mus.*, XXVI, p. 867.

emargination; cerci very slightly incurved, apically decurved, internal inferior margin with a blunt basal tubercle, surface strongly hirsute; first segment of the genital opercule bearing a recurved claw-like process immediately before the apex; second segment of the opercule hastate. Limbs slender, without distinct foliaceous expansions. Anterior femora half again as long as the mesonotum, trigonal in section; tibiæ slightly exceeding the femora in length, quadrate in section; metatarsi considerably exceeding the remaining tarsal joints in length. Median femora equal in length to the mesonotum, slightly curved, subquadrate in section, genicular lobes triangular; tibiæ equal to the femora in length, compressed; metatarsi slightly shorter than the remaining tarsal joints. Posterior femora reaching to the middle of the fifth abdominal segment, equal to the head, pronotum and mesonotum in length, slightly curved, subquadrate in section; tibiæ slightly longer than the femora; metatarsi slightly longer than the remaining tarsal joints.

General color greenish-brown; limbs annulate with pale ochraceous.

♀.—Form elongate, moderately robust; size medium; surface granulose. Head somewhat elongate, strongly tuberculate; interspace between the eyes with a pair of erect foliaceous lobes, the margins of which are irregularly crenulate; eyes subcircular, moderately prominent; antennæ over twice the length of the anterior femora, basal joint depressed. Pronotum longitudinal, slightly expanded posteriorly; median transverse sulcus distinctly marked. Mesonotum about twice as long as head and pronotum together, subequal; median longitudinal carina distinctly marked, subobsolete posteriorly. Metanotum (with median segment) about three-fourths the length of the mesonotum, subequal; median segment about one-third as long as the metanotum itself, transverse. Abdomen exceeding the head and thoracic segments in length, subequal in width, surface longitudinally striate as well as tuberculate; fifth segment with the median portion of the apical margin bearing a pair of small converging foliaceous lobes; sixth segment equal to the fifth in length, subequal to the latter in width; seventh and ninth segments subequal in length, eighth transverse, apical margin of the ninth segment obtusely produced and with a broad V-shaped median emargination; styles broad, depressed, somewhat produced apically; subgenital plate produced, reaching to the posterior margin of the eighth dorsal segment, carinate, apex subacuminate with a narrow triangular median emargination. Limbs of rather slender build and but moderate length. Anterior femora exceeding the length of the mesonotum by the length

of the median segment, compressed in the apical two-thirds, subquadrate in section; tibiæ exceeding the femora by almost the length of the pronotum, quadrate in section; metatarsi very considerably exceeding the remaining tarsal joints in length. Median femora slightly exceeding the metanotum (with median segment) in length, subquadrate in section, inferior margins with an irregularly rounded prebasal lobe, genicular lobes acuminate; tibiæ subequal to the femora in length, quadrate in section; metatarsi considerably shorter than the remaining tarsal joints. Posterior femora slightly exceeding the second to fourth abdominal segments in length, subquadrate in section; tibiæ slightly longer than the femora in length, quadrate in section; metatarsi but slightly shorter than the remaining tarsal joints.

General color yellowish-brown (green in life?), becoming yellowish-green on the limbs.

Measurements.

	♂	♀
Total length,	63 mm.	76.3 mm.
Length of pronotum,	2.6 "	4 "
Length of mesonotum,	14.5 "	16.5 "
Length of metanotum (with median segment),	12 "	12.5 "
Length of abdomen,	33 "	approx. 48 "
Length of anterior femora,	20.5 "	18.1 "
Length of anterior tibiæ,	22.5 "	21.5 "
Length of median femora,	15 "	14.2 "
Length of posterior femora,	19.5 "	20 "

One additional female specimen from the type locality has also been examined. It is considerably smaller than the type, but otherwise perfectly identical.

Genus **HETERONEMIA** Gray,¹¹

1835. *Heteronemia* Gray, Synopsis Spec. Ins. Fam. Phasm., pp. 13 and 19.

Type.—*H. mexicana* Gray.

Heteronemia yersiniana (Saussure).

1868. *Bacteria Yersiniana* Saussure, Revue et Magasin de Zoologie, 2e ser., XX, p. 65. [Porto Rico.]

One male; Utuado, Porto Rico, April 6, 1900. (Dr. C. W. Richmond.) [U. S. N. M.]

¹¹ There seems no escape from the substitution of this name for the species to which the time-honored name *Bacunculus* has been applied. Gray's name has three years' priority, and though based on partially abnormal characters, its true position has been definitely shown by Westwood (*Cat. Orth. Ins. Brit. Mus.*, I, pp. 25-26).

Heteronemia ignava n. sp.

Types.—♂ and ♀; Piedras Negras, Costa Rica. (Schild and Burgdorf.) [Cat. No. 6,976, U. S. N. M.]

Apparently closely related to *H. mexicana* Gray and *H. striata* (Burmeister), but differing from the former in the stouter body, longer limbs and different abdominal appendages in the male; and from *striata* in the shorter seventh abdominal segment in the male, and the different proportions of the three terminal segments in the female. From *H. festuca* (Giglio-Tos), another ally, it can readily be separated by the character of the female subgenital opercule, which is tridentate in *festuca*.

♂.—Size rather small; form moderately slender, subequal; surface chiefly glabrous. Head subequal, dorsal aspect bearing about four longitudinal rows of minute blunt tubercles; eyes very prominent; antennæ rather robust, about equal to half the entire length, basal joint somewhat depressed, the greatest width basal. Pronotum subequal in width, over half again as long as broad. Mesonotum very slightly expanded posteriorly, equal to the median femora in length. Metanotum (with median segment) about three-fourths the length of the mesonotum; median segment slightly transverse, about one-fifth the total length of the metanotum. Abdomen with the segments longitudinal, but about equal in width to the mesonotum; seventh dorsal segment slightly bullate apically and fused with the short eighth segment, the line of demarcation being hardly visible; ninth dorsal segment operculate, somewhat bullate, the apical margin with a deep V-shaped median emargination; cerci but slightly shorter than the ninth segment, compressed, slightly deurved and provided with a dentiform point at the lower angle of the apical margin; subgenital opercule with the apical margin rounded, and provided with an acute unguial preapical hook. Limbs rather short, femora and tibiæ subquadrate in section, all unarmed. Anterior femora and tibiæ each equal to the pronotum, mesonotum and half of the head in length; metatarsi equal to the remaining joints in length. Median femora and tibiæ equal to the mesonotum in length; metatarsi considerably shorter than the remaining tarsal joints. Posterior femora reaching to the apex of the fourth abdominal segment; tibiæ slightly exceeding the femora in length; metatarsi about equal to the remaining tarsal joints in length.

General color pale greenish-yellow, becoming brownish on the limbs and apex of the abdomen; head with faint longitudinal bars of dull brown.

♀.—Size rather small; form slender, thoracic width greater than the abdominal width; surface very sparsely and minutely tuberculate. Head subequal in width, slightly larger than the pronotum, surface bearing longitudinal rows of minute tubercles; eyes prominent; antennæ exceeding half the length of head and body, basal joint slightly depressed, subequal in width. Pronotum subequal in width, twice as long as broad. Mesonotum equal in length to the posterior femora, subequal in width, bearing a faint longitudinal carina which extends to the apex of the abdomen. Metanotum (with median segment) about three-fourths the length of the mesonotum; median segment subquadrate, equal to one-fifth the length of the metanotum alone. Abdomen with the segments strongly longitudinal, not equalling the thoracic segments in width, seventh dorsal segment tectate, about equal in length to the eighth and ninth together; ninth segment strongly tectate, carinate, the apical margin with a small triangular emargination; styles projecting beyond the ninth dorsal segment by slightly over half the length of the latter, compressed, apex rounded; subgenital opercule slightly exceeding the apical margin of the eighth dorsal segment in length, apex subacuminate, the preapical portion with a short unguis process. Limbs rather short, the femora and tibiæ subequal in length. Anterior femora equal to the pronotum and mesonotum in length; metatarsi exceeding the remaining tarsal joints in length. Median femora slightly longer than the metanotum (with median segment); tibiæ slightly shorter than the femora; metatarsi not quite equal to the remaining tarsal joints in length. Posterior femora reaching to the middle of the fourth abdominal segment; metatarsi about equal to the remaining tarsal joints.

General color dull olive-brown, the limbs obscurely annulate with very dull ochraceous; tubercles on head and thoracic segments milky white.

Measurements.

	♂	♀
Total length.	50.5 mm.	54 mm.
Length of pronotum,	2.2 "	2.5 "
Length of mesonotum,	11.5 "	12.2 "
Length of metanotum (including median segment),	9 "	10 "
Length of abdomen,	26 "	28.5 "
Length of anterior femora,	15.5 "	14.5 "
Length of anterior tibiæ,	15 "	14 "
Length of median femora,	11.2 "	10.5 "
Length of posterior femora,	13.5 "	12.5 "

Three female topotypes of this form agree perfectly with the type,

except that two of them are slightly lighter in color, much as in the male. This is, of course, of little consequence, being due entirely to the condition of the specimen. A smaller female from Atoñas, Costa Rica, is greenish-white in color, but otherwise is perfectly typical.

Genus **OREOPHOETES** n. gen.¹²

Allied to *Heteronemia*, but distinguished by the peculiar structure of the apical abdominal segments and the shape of the pronotum.

Pronotum slightly longitudinal, the anterior angles considerably produced, rounded; median transverse suture very distinct; postero-lateral angles depressed. Abdomen comparatively short, the basal segments but slightly longitudinal; sixth dorsal segment compressed, carinate; seventh dorsal segment very slightly shorter than the sixth, carinate, rather bullate apically; eighth segment slightly longer than the sixth segment, slightly depressed, carinate; ninth segment transverse, apex with broad triangular emargination; cerci subequal in width, slightly longer than the ninth dorsal segment. Sixth ventral abdominal segment compressed, carinate; seventh compressed, carinate, about half the length of the sixth; eighth segment about half the length of the seventh, compressed but not carinate; subgenital opercule bullate, equal in length to the eighth dorsal segment, apex rotundato-truncate, apical margin strongly reflexed, forming a very distinct rim. Limbs elongate, unarmed.

Type.—*Bacteria peruana* Saussure.

Oreophoetes peruana (Saussure).

1868. *Bacteria Peruana* Saussure, Revue et Magasin de Zoologie, 2e ser., XX, p. 65. [Peru.]

One male; Piches and Perene Valleys, Peru, 2,000–3,000 feet. (Soc. Geog. de Lima.) [U. S. N. M.]

This species has been recorded by Saussure from the plateau of Peru, beside the very broad type locality.

Genus **DYME** Stål.

1875. *Dyme* Stål, Recensio Orthopterorum, III, pp. 24 and 77.

Type.—*Dyme bifrons* Stål.

Dyme bifrons Stål?

1875. *D[yme] bifrons* Stål, Recensio Orthopterorum, III, p. 77. [Peru.]

One male; Piches and Perene Valleys, Peru, 2,000–3,000 feet. (Soc. Geog. de Lima.) [U. S. N. M.]

While this specimen is but two-thirds the size of the type male of *bifrons*, the proportions are about the same. The eighth dorsal

¹² *ορειφοειτας, mountain nymph*, in allusion to the locality of the type species.

abdominal segment exhibits no such character as "angulis posticis in dentem sat longum productis instructo," and for that reason I have queried the determination, although the specimen fully agrees otherwise.

Genus **CALYNDA** Stål.

1875. *Calynda* Stål, Recensio Orthopterorum, III, pp. 24 and 78.

Type.—*C. bicuspis* Stål.

Calynda bicuspis Stål.

1875. *C[alynda] bicuspis* Stål, Recensio Orthopterorum, III, p. 78. [Chiriqui.]

One female; Tucurrique, Costa Rica. (Schild and Burgdorf.) [U. S. N. M.]

This specimen is considerably larger than Stål's type, but agrees absolutely with the diagnostic characters given by him. A character apparently overlooked by Stål is the presence of a rounded foliaceous lobe on the basal portion of the inferior lateral carinæ of the median femora.

Genus **BOSTRA** Stål.

1875. *Bostra* Stål, Bihang till K. Svenska Vet. Akad. Handlingar, bd. 2, No. 17, p. 6.

Type.—*Bacteria turgida* Westwood.

Bostra incompta n. sp.

Type.—♂; San Carlos, Costa Rica. (Schild and Burgdorf.) [Cat. No. 6,977, U. S. N. M.]

Apparently closer related to *B. turgida* (Westwood) than to *B. dorsuaria* Stål. From *turgida* it differs in the very much greater size and the shape of the terminal abdominal segments. From *dorsuaria* it can readily be distinguished by the unarmed head and smaller size.

Size large; form very slender and elongate; surface glabrous. Head rather short, very slightly longer than the pronotum, subequal in width; eyes circular, not prominent; antennæ about equal to the body in length, basal joint oblong, scarcely depressed. Pronotum subequal in width, half again as long as broad. Mesonotum slightly shorter than the median femora, slender and subequal except for a slight posterior expansion. Metanotum (with median segment) not quite three-fourths the length of the mesonotum, scarcely wider than the mesonotum; median segment equal to over two-thirds the length of the metanotum itself. Abdomen with the six basal segments elongate, all at least three times as long as broad, the length of segments decreasing toward the apex; seventh dorsal segment somewhat bullate,

slightly longer than broad; eighth segment equal to the seventh in length, compressed, lateral portions produced inferiorly, the margins rounded except the posterior angle which is slightly acuminate; ninth dorsal segment very slightly longer than broad, somewhat bullate, apical margin truncate with a very broad shallow median emargination; cerci rather small, slightly clavate, curved; subgenital opercule not quite equalling the apex of the eighth dorsal segment, large, compressed, tectate, apical portion with a longitudinal keel which develops a blunt point below and slightly posterior to the superior margin. Limbs very slender and elongate, carinate, unarmed. Anterior femora equal to the head, pronotum and mesonotum in length; tibiae exceeding the femora by the length of the head and pronotum; metatarsi slightly exceeding the remaining tarsal joints in length. Median femora equal to the mesonotum in length; tibia exceeding the femora by the length of the pronotum; metatarsi equal to the remaining tarsal joints in length. Posterior femora reaching to the apex of the fourth abdominal segment; tibiae exceeding the femora by about half the length of the first abdominal segment; metatarsi slightly exceeding the remaining tarsal joints in length.

General color brownish-olive, dark in the genicular regions and pale on the head, pronotum, apex of the abdomen and proximal portions of the femora.

Measurements.

Total length,	107	mm.
Length of pronotum,	3.7	"
Length of mesonotum,	27	"
Length of metanotum (with median segment),	20	"
Length of abdomen,	56	"
Length of anterior femora,	34.5	"
Length of anterior tibiae,	42	"
Length of median femora,	28	"
Length of posterior femora,	33.5	"

Two additional specimens of this species have been examined, one a topotype, the other from Piedras Negras, Costa Rica. They agree perfectly with the type in structure and coloration.

***Bostra remiformis* n. sp.**

Type.—♀; Piedras Negras, Costa Rica. (Schild and Burgdorf.)
[Cat. No. 6,978, U. S. N. M.]

Apparently not allied to the only species of the genus, *B. turgida* Westwood, known from the female. It does not appear to be the female of any of the species based on the opposite sex. From the female of *B. turgida* it differs in the non-spinous body, the triangularly emar-

ginate apex of the ninth dorsal abdominal segment, the very different cerci, and the unarmed limbs.

Size medium; form very slender and elongate; surface subglabrous. Head rather elongate, narrowed posteriorly; eyes subcircular, not prominent; antennæ slightly exceeding half the length of the body, filiform, basal joint moderately depressed. Pronotum about twice as long as broad. Mesonotum about equal in length to the posterior femora. Metanotum (with median segment) not quite three-fourths the length of the mesonotum; median segment two-thirds the length of the metanotum itself. Abdomen with six basal segments subequal in length; seventh, eighth and ninth segments sharply tectate, the seventh slightly exceeding either of the others in length, ninth with the apical margin with a broad rounded median emargination, exposing the rounded apex of the supra-anal plate; cerci elongate, depressed, paddle-shaped, slightly exceeding the ninth segment in length, apex rounded; subgenital opercule short, not reaching to the apical margin of the eighth dorsal segment, apex triangular produced, the preapical portion developing a recurved unguis process. Limbs of moderate length, strongly carinate and compressed. Anterior femora slightly exceeding the mesonotum in length; tibiæ slightly exceeding the femora in length; metatarsi slightly exceeding the remaining tarsal joints in length. Median femora about five-sixths the length of the mesonotum; tibiæ about equal to the femora in length; metatarsi equalled in length by the remaining tarsal joints. Posterior femora equal to three and a half of the fourth basal abdominal segments; tibiæ equal to the four basal segments; metatarsi exceeding the remaining tarsal joints in length.

General color yellowish-brown (probably green in life), very pale on the anterior limbs.

Measurements.

Total length,	78 mm.
Length of pronotum,	3 "
Length of mesonotum,	18.1 "
Length of metanotum (including median segment),	13.5 "
Length of abdomen (including cerci),	41.2 "
Length of anterior femora,	20 "
Length of anterior tibiæ,	21.5 "
Length of median femora,	15.5 "
Length of posterior femora,	19 "

Genus **ONCOTOPHASMA** n. gen.

Type.—*Bostra martini* Griffini.

Body of medium build; pronotum for the greater part slenderer than the abdomen. Metathorax strongly inflated and rugose; the tumid

section involving the pleura as well as the dorsal portion, but not the metasternum, which is, however, strongly rugose; anterior portion of the metathorax not inflated. Median segment half again as long as broad, about equal to half the length of the metanotum itself. Anterior and median limbs without prominent spines, except the genicular lobes of the median femora which are spiniform, and two median apical spines on the inferior surface of the same limbs. Posterior femora inflated, armed along the median inferior carina with seven or eight distinct spines, the apical ones of large size, genicular lobes spiniform; tibiæ with the carinæ serrulate, the inferior pair also provided with dentiform spines.

This genus is near *Bostra*, but can be separated by the swollen metathorax and enlarged and strongly armed posterior femora. It will include *Bostra podagrica* Stål,¹³ which has all the characters of *Oncotophasma* except the swollen metathorax, the character of which Stål does not mention. The two genera may be separated as follows:

Males.

- A.—Posterior femora unarmed; intermediate femora not spined apically, *Bostra* Stål.
 A.1.—Posterior femora strongly spinose; intermediate femora apically bispinose, *Oncotophasma* Rehn.

Oncotophasma martini (Griffini).

1896. *B[ostra]Martini* Griffini, Bollettino dei Musei di Zoologia ed Anatomia comparata, XI, No. 236, p. 10, fig. [Forests by the lagoon of Pita, Darien, Colombia.]

One male; San Carlos, Costa Rica. (Schild and Burgdorf.) [U. S. N. M.]

Genus **CLONISTRIA** Stål.

1875. *Clonistria* Stål, Bihang till K. Svenska Vet. Akad. Handlingar, Band 2, No. 17, p. 6.

Type.—*Clonistria bartholomæa* Stål.

Clonistria linearis (Drury)?

1770. [*Mantis*] *linearis* Drury, Ill. Nat. Hist. Exot. Ins., I, p. 130, and Append., Pl. I, fig. 3. [Antigua.]

One male; Jamaica. [U. S. N. M.]

As considerable uncertainty has prevailed regarding the identity of Drury's *linearis*, a question which cannot satisfactorily be settled without a study of Antigua material, I have queried the determination.

The specimen in hand has the under surface of the head marked with

¹³ *Recessio Orthopterorum*, III, p. 79

blackish, while the whole upper surface is dull greenish more or less distinctly overcast with brownish.

Subfamily BACTERINÆ (*Palophinæ* Kirby¹⁴).

Genus **CLADOMORPHUS** Gray.

1835. *Cladomorphus* Gray, Synop. Ins. Fam. Phasmid., p. 15.

Type.—As restricted by Serville, *C. phyllinus* Gray.¹⁵

Cladomorphus phyllinus Gray.

1835. *C[ladomorphus] phyllinus* Gray, Synop. Ins. Fam. Phasmid., p. 15 [Brazil.]

One female; San Antonio de Jesu, Brazil. [A. N. S. Phila.]

This specimen is equal to the measurements given by Saussure.¹⁶ I have adopted the above generic and specific names in preference to *Phibalosoma lepeletierii*, agreeing with Kirby¹⁷ that page priority should be applied to this case, regardless of usage as to one sex having a systematic value superior to the other.

Genus **PTERINOXYLUS** Serville.

1839. *Pterinoxylus* Serville, Orthoptères, p. 226.

Type.—*P. difformipes* Serville (= *Haplopus eucnemis* Burmeister).

Pterinoxylus eucnemis (Burmeister)?

1838. *H[aplopus] eucnemis* Burmeister, Handb. d. Entom., II, p. 577. [Interior Brazil.]

Three specimens, all immature; two males, one female; Tucurrique and Turrialba, Costa Rica. (Schild and Burgdorf.) [U. S. N. M.]

This series, while all immature, range in size from 46 to 93 millimeters in total length, and agree perfectly with each other in the character of the lobes and nodes. The figure of Burmeister's type given by Westwood¹⁸ appears to represent a form having the lobes more rounded and not so distinctly acuminate as in the Costa Rican individuals.

Genus **BACTERIA** Lepeletier and Serville.

1827. *Bacteria* Lepeletier and Serville, Encyclop. Method., Ins., X, p. 445.

Type.—*Mantis ferula* Fabricius (= *arumatia* Stoll).¹⁹

¹⁴ As I have not had the opportunity to examine more than a single specimen of the genera which Kirby (*Trans. Linn. Soc. London*, 2d ser., VI, p. 464) transferred to the *Heteroneminae* (*Bacunculinae* Auct.), I have not accepted his action. It is very evident that *Bacteria* at least is closely related to the *Heteroneminae*, but Kirby's remarks are so brief that we glean little regarding the characters on which he proposes the removal.

¹⁵ Of the four original species of the genus but one (*perfoliatus*) has been removed, and that to *Ceroys* by Serville in 1839.

¹⁶ *Recherch. Zool. l'Amer. Cent., Mexique*, Orth., p. 180.

¹⁷ *Proc. Royal Dublin Soc.*, n. s., VI, p. 571.

¹⁸ *Cat. Orth. Ins. Brit. Mus.*, I, Pl. XXXVI, fig. 1.

¹⁹ The name *Bacteria* was first used in the Latin form by Lepeletier and Ser-

Bacteria cubensis (Saussure).

1868. *Phyalosoma Cubensis* Saussure, Revue et Magasin de Zoologie, 2e ser., XX, p. 67. [Cuba.]

One female; Baracoa, Cuba, February 4, 1902. (William Palmer.) [U. S. N. M.]

As the female of this species has never before been recorded, a description may prove of interest.

Size medium; form elongate; surface smooth. Head somewhat longitudinal, depressed, posterior portion constricted; interocular region with several transverse depressions; occiput with a fine longitudinal sulcus; eyes globose, very prominent; antennæ not quite half as long as the body, basal joint elongate-depressed. Pronotum longitudinal, almost twice as long as broad; transverse median depression slightly in advance of the middle; anterior portion with a transverse depression immediately posterior to the anterior margin; longitudinal median carina slight. Mesonotum nearly six times as long as the pronotum, subequal in width except for a slight anterior constriction and a moderate expansion in the supra-coxal region. Metanotum (with median segment) three-fifths the length of mesonotum; median segment occupying about three-fifths the length of the whole segment. Abdomen about equal to the thorax in length; four basal segments longitudinal, equal in size; fifth dorsal segment somewhat inflated apically; sixth segment compressed, tectate, carinate, slightly shorter than the preceding segments in length; seventh and eighth segments subequal in size, tectate, carinate, the posterior portion of the carina produced into a small rounded process; ninth segment about equal to the eighth in length, tectate, carinate, the lateral aspects each bearing a low boss-like rounded swelling, apical margin with a very shallow emargination, exposing the extreme tip of the supra-anal plate; cerci not half the length of the ninth dorsal segment, acuminate; subgenital opercule elongate, attenuate, apex decidedly acuminate, reaching to the apex of the ninth dorsal segment. Anterior femora and tibiæ compressed, each almost equal to the mesonotum in length; metatarsi equal to the remaining joints in length, superior surface with a distinct foliaceous crest. Median femora and tibiæ somewhat

ville, but is usually credited to Latreille. Latreille (*Fam. Nat. Regn. Anim.*, p. 412, 1825) published simply the French form Baetérie, and included no species under it. In 1807, Latreille (*Gen. Crust. et Insect.*, III, pp. 87-88) divided the genus *Phasma* into two sections, the first of which he subdivided, and it was on the second division of the first section that Lepeletier and Serville based their genus. This division included three species, all of Fabricius, *filiformis*, *ferula* and *calamus*. As the identification of these names is rather uncertain, I have selected *ferula* as the type, as it is usually considered a synonym of *arumatia* Stoll, which is based on a figure.

compressed, each slightly exceeding the metanotum in length; metatarsi about as long as the remaining tarsal joints, not cristate. Posterior femora somewhat compressed, equal to the three basal abdominal joints in length; tibiæ equal to the first three and half of the fourth basal abdominal segments; metatarsi slightly exceeding the remaining tarsal joints in length.

General color gray-brown, the pronotum grayish ochraceous, head with an indistinct blackish postocular bar.

Measurements.

Total length,	82.5 mm.
Length of pronotum,	3.5 "
Length of mesonotum,	23.7 "
Length of metanotum (with median segment),	14 "
Length of median segment,	8 "
Length of abdomen,	38 "
Length of anterior femora,	22.1 "
Length of anterior tibiæ,	22 "
Length of median femora,	14.5 "
Length of posterior femora,	17.9 "

Genus **APLOPUS** Gray.

1835. *Aplopus* Gray, Synop. Ins. Fam. Phasmid., p. 34.

Type.—*A. micropterus* (Lep. and Serv.) (= *Phasma angulata* Stoll).

Aplopus cytherea Westwood.

1859. *Haplopus Cytherea* Westwood, Cat. Orth. Ins. Brit. Mus., I, p. 86, Pl. XVIII, fig. 5. [San Domingo, Haiti.]

Two specimens, male and female; "West Indies." [U. S. N. M.]

As the female of this species was previously unknown, a description of the same is here appended.

Size large; form elongate; surface of the thoracic segments sparsely spinous. Head with the pair of occipital spines very prominent, the left considerably smaller than the right; eyes globose; antennæ equal to the head and thorax in length, basal joint of comparatively small size. Pronotum slightly longer than broad, in general shape similar to the male, the anterior pair of spines reduced in size and hardly larger than a posterior pair. Mesonotum about four times the length of the pronotum, rather narrow anteriorly, very gradually expanding posteriorly; spines disposed as in the male, but much less salient; mesosternum with an armature of obsolete spines disposed as in the male. Metanotum slightly more than half the length of the mesonotum. Tegmina slightly more than one-third the length of the mesonotum, ovate, coriaceous, with the venation very distinct and irregularly disposed; median pro-

tubérance longitudinal, rounded. Wings almost twice the length of the tegmina; costal and discoidal regions coriaceous and subreticulate as in the tegmina. Abdomen with the segments distinctly longitudinal; sixth dorsal segment somewhat expanded; seventh segment compressed, almost equal to the sixth in length; eighth and ninth segments subequal in length and width, together but slightly longer than the seventh segment, the ninth carinate and with the apex sinuate; supra-anal plate small, transverse, subtriangular, not half the length of the ninth dorsal segment; cerci short, conoid, not as long as the supra-anal plate; subgenital plate cymbiform, carinate, elongate, exceeding the apex of the supra-anal plate by the length of the fifth and sixth abdominal segments, apex narrowly rounded. Anterior femora three-fourths the length of the mesonotum, basal flexure sharp; tibiæ slightly longer than the femora; metatarsi somewhat shorter than the remaining tarsal joints. Median femora equal to the anterior femora in length. inferior surface with three spines on the apical portion of the median line, the anterior and posterior margins each apically with a single spine; tibiæ about equal to the femora in length; metatarsi hardly more than half the length of the remaining tarsal joints. Posterior femora exceeding the other femora and equal to the first, second and half of the third basal abdominal segments in length, anterior inferior margin with two apical spines, median line of the inferior surface with three spines, posterior inferior margin with a single apical spine; tibiæ slightly exceeding the femora in length; metatarsi but slightly shorter than the remaining tarsal joints.

General color (from spirits) vinaceous brown, metathorax with the pleura bearing a longitudinal whitish bar, a style of coloration also found on the lateral portions of the base of the subgenital opercule.

Measurements.

Total length,	128	mm.
Length of pronotum,	5.7	"
Length of mesonotum,	27.5	"
Length of metanotum (including median segment),	15.7	"
Length of tegmina,	10	"
Length of wings,	12.5	"
Length of abdomen (including subgenital opercule),	79	"
Length of subgenital opercule,	27.5	"
Length of anterior femora,	19.5	"
Length of anterior tibiæ,	20.5	"
Length of median femora,	19	"
Length of posterior femora,	23	"

Aplopus similis n. sp.

Types.—♂ (immature) and ♀; Swan Island, Caribbean Sea. [Cat. No. 7,343, U. S. N. M.]

Closely allied to *A. ligia* Westwood,²⁰ but differing in the much shorter antennæ, longer mesonotum and posterior limbs, the different character of the lateral expansions of the sixth abdominal segment, and the decidedly shorter subgenital opercule.

♂.—Size medium; form rather elongate. Head slightly longitudinal; occiput with two large acute spines of which the right is the larger, posterior margin of the head with a pair of small median spines; eyes subglobose; antennæ stout, somewhat depressed, slightly exceeding in length the head, pronotum and mesonotum, basal joint oblong, strongly depressed. Pronotum slightly longitudinal, anterior margin concave, posterior margin convex, lateral margins with a very prominent and deep semicircular emargination; transverse sulci two in number, one prominent and immediately posterior to the anterior margin, the other submedian and shallower in character; anterior half of the pronotum with two pairs of spines, the anterior of which is more distinct than the posterior, the remaining portion of the surface granulate. Mesonotum equal to the three basal abdominal segments; anterior portion constricted, gradually expanding to near the median portion, which is equal to the posterior width; surface with five pairs of irregularly placed spines, two pairs being very close to the anterior margin, while more than the posterior third of the whole surface is free from spines; lateral margins with an even row of low tubercles; mesothoracic pleura with a number of subobsolete protuberances; mesosternum with four pairs of low evenly placed tubercles. Metanotum about two-thirds the length of the mesonotum, median segment occupying very slightly more than half the length; metasternum with a few very obsolete tubercles. Tegmina and wings not developed, the rudiments very small. Abdomen considerably exceeding the head and thoracic segments in length; five basal segments longitudinal, simple, the fourth and fifth slightly shorter than the first to third; sixth segment longitudinal, slightly shorter than the fifth in length, the posterior lateral portions developed into smaller triangular lobes; seventh segment slightly shorter than the sixth; eighth and ninth segments smaller than the preceding segments, equal in length, both carinate, apical portion of the ninth truncate and with a distinct thickened elevated rim; cerci short, thick and rounded, but slightly exceeding the apex of the ninth segment; subgenital opercule large, slightly exceeding the eighth dorsal segment

²⁰ *Catal. Orth. Ins. Brit. Mus.*, I, p. 89, Pl. XI, figs. 1 and 2.

in length. Limbs distinctly carinate. Anterior femora equal to the metanotum and half of the first abdominal segment in length, basal flexure very marked, median line of the inferior surface with two apical spines; tibiæ very slightly shorter than the femora, the superior surface with a slight distal swelling; metatarsi but little shorter than the remaining tarsal joints. Median femora somewhat shorter than the anterior femora, superior margins each with a slight preapical lobe, anterior and posterior inferior margins serrulate, the former with two preapical spines, the latter with one, inferior median line with four evenly distributed spines; tibiæ not quite equalling the femora in length, distinct subbasal and preapical swellings developed; metatarsi about half the length of the remaining tarsal joints. Posterior femora but slightly shorter than the mesonotum in length, slight superior preapical lobes developed as in the anterior limbs, spine arrangement as in the median limbs except that the median line bears five spines; tibiæ equal to the femora in length, the swellings of the median limbs but slightly represented; metatarsi about two-thirds the length of the remaining tarsal joints.

♀.—Size large; form elongate. Head slightly ovate; occipital processes acute, much as in the male, but large and distinct; spines on the posterior margin of the head small but acute; eyes subglobose; antennæ about equal to the thoracic segments in length, filiform, basal joint depressed and with the lower surface concave. Pronotum about equal to the head in length; margins as in the male; spines numerous and rather regularly distributed, of moderate height, the anterior pair slightly exceeding the others in size. Mesonotum slightly exceeding the three basal joints of the abdomen in length, general shape very similar to that of the male; surface with numerous spines of not very regular distribution, a defined lateral row of evenly sized spines being present; mesothoracic pleura well spined; mesosternum with over twelve rather low spines. Metanotum not quite equal to the two basal abdominal segments in length; median segment equal to the first abdominal segment in length; metathoracic pleura with a longitudinal row of about nine rather even spines. Tegmina rather more than half the length of the metanotum (including median segment), ovate, coriaceous; median protuberance low, rounded; venation very apparent, subreticulate. Wings equal to the tegmina in length, costal and discoidal areas subreticulate as in the tegmina. Abdomen with the segments all more or less longitudinal; five basal segments subequal in length; the first, second and third with a median pair of small spiniform processes placed close to the apical margin; sixth segment

slightly shorter than the fifth, slightly amplicate, the lateral margins gently rounded; seventh segment compressed, equal to the sixth in length; eighth and ninth segments together about equal in length to the preceding segment, the ninth with the apical margin rectangulate, the apex with a triangular emargination exposing the rectangulate and carinate apex of the supra-anal plate; cerci very stout and short, depressed, not exceeding the apex of the ninth dorsal segment, subgenital opercule very long, exceeding the tip of the supra-anal plate by the length of the seventh and eighth segments, hastate, carinate, apex rectangulate. Anterior femora three-fourths the length of the mesonotum, basal flexure decided; tibiæ equal to the femora in length; metatarsi not quite as long as the remaining tarsal joints. Median femora equal to the first two basal segments of the abdomen in length, anterior and posterior inferior margins as in the male, the inferior median line with five or six spines; tibiæ equal to the femora in length, the structure similar to that of the male but less apparent; metatarsi but little more than half the length of the remaining tarsal joints. Posterior femora equal to the first two and a half of the third abdominal segments, the margins as in the male, the inferior median line with five or six spines; tibiæ equal to the femora in length and with the structure very similar; metatarsi shorter than the remaining tarsal joints.

General color (from spirits) dull ochraceous, the nine prominent spines tipped with black; tegmina with the venation dull cream on a blackish ground; wings with the costal and discoidal areas similar to the tegmina, posterior field pearl-white with the nerves purplish-black.

Measurements.

	♂	♀
Total length,	78 mm.	134 mm.
Length of pronotum,	4 "	6.5 "
Length of mesonotum,	17.5 "	29.5 "
Length of metanotum (including median segment),	11.5 "	17 "
Length of median segment,	6 "	9.5 "
Length of tegmina,		10 "
Length of wings,		10 "
Length of abdomen,	42 "	82 "
Length of anterior femora,	14 "	21.5 "
Length of anterior tibiæ,	13.7 "	22.5 "
Length of median femora,	12.7 "	18.7 "
Length of posterior femora,	15.5 "	24.5 "
Length of subgenital opercule (from extreme base),		28.5 "

*Aplopus achalus*²¹ n. sp.

Type.—♂; Adjuntas, Porto Rico, April 12, 1900. (Dr. C. W. Richmond.) [Cat. No. 7,344, U. S. N. M.]

Compared with *jamaicensis* Drury, the closest allied species, this new form may be separated by the unarmed head and mesonotum, the longer tegmina, the slenderer and weaker limbs, and the coloration. It appears very unlikely that this is the male of *angulata* Stoll (= *micropterus* Lep. and Serv.), as the female of that species has very prominent cephalic spines, and in all respects resembles the females of other species of the genus, the known males of which are very different from this in structure. Stoll's species was recorded from Porto Rico by Haan,²² but there appears no likelihood that this new form is at all closely allied to it.

Size rather small; form moderately elongate; surface subglabrous. Head ovate, depressed; occiput without spines; eyes subglobose. Antennæ equal to the head, thorax and tegmina in length, robust, filiform, basal joint depressed, the inferior surface concave. Pronotum subquadrate, somewhat constricted posteriorly, anterior margin concave, the posterior convex; transverse anterior sulcus obsolete centrally, transverse median sulcus distinct, strongly impressed, longitudinal median sulcus slight, not extending the whole length of the pronotum. Mesonotum slightly over three times the length of the pronotum, gradually expanding posteriorly, surface with several irregular obsolete tubercles. Metanotum equal to the mesonotum in length; metathoracic pleura and metasternum rugulose; the whole metathorax depressed. Tegmina equal to the mesonotum in length, acute-ovate; median protuberance somewhat longitudinal, acute. Wings long, reaching to the seventh abdominal segment. Abdomen with all the segments more or less longitudinal, gradually decreasing in size from the base to the sixth segment; sixth and following segments distinctly carinate and tectate; seventh and eighth segments of the same general form, the latter slightly the shorter; ninth segment slightly shorter than the eighth segment, somewhat constricted toward the apex, apical margin subtruncate with a very broad and shallow median emargination; cerci about two-thirds the length, subequal, apex blunt; subgenital opercule very slightly exceeding the apical margin of the eighth dorsal segment, cymbiform, carinate, apex rounded with a narrow median triangular emargination. Anterior femora equal to the pronotum and mesonotum in length, basal flexure

²¹ ἀχάλος, i. e., unarmed.

²² *Verhandl. Natuurl. Geschied. Nederl. Overzeesche Bezitt.*, Orth., p. 103, 1842.

strongly marked; tibiæ slightly shorter than the femora; metatarsi but slightly more than half the length of the remaining tarsal joints. Median femora a trifle longer than the tegmina, anterior inferior margin with two and the posterior inferior margin with one apical spine, median line with one spine which is more or less obsolete; tibiæ considerably shorter than the femora and almost equalling the mesonotum in length; metatarsi equalled in length by the second and third tarsal joints. Posterior femora equal to the first, second and half of the third abdominal segment, anterior inferior margin with two and the posterior with one apical spine, median line with two subapical spines; tibiæ about three-fourths the length of the femora; metatarsi equal to the second, third and fourth tarsal joints in length.

General color pale yellowish-green, washed with brownish on the head, pronotum and mesonotum; tegmina and wings with the veins darker than the basic color, costal margin of the tegmina and the base of the same region of the wing opaque-white, discoidal area of the tegmina smoky-brown, posterior field of the tegmina milky-white; antennæ and an obscure postocular bar pale purplish; marginal femoral spines black.

Measurements.

	<i>achalus</i> ♂	<i>jamaicensis</i> ♂
Total length,	61.5 mm.	65 mm.
Length of pronotum,	3 "	3 "
Length of mesonotum,	9 "	9.5 "
Length of tegmina,	10 "	8.2 "
Length of wings,	39 "	36.5 "
Length of anterior femora,	11.8 "	11.5 "
Length of anterior tibiæ,	10 "	10 "
Length of median femora,	11 "	10 "
Length of posterior femora,	14.8 "	13.5 "

Genus **ISCHNOPODA** Grandidier.

1869. *Ischnopoda* Grandidier, Revue et Magasin de Zoologie, 2e ser., XXI, p. 293.

Type.—*I. reyi* Grandidier.

Ischnopoda phillipsi Kirby.

1897. *Ischnopoda Phillipsi* Kirby, Trans. Linn. Soc. London, 2d ser., VI, p. 467. [Somaliland.]

1901. *Palophus reyi* Rehn (not of Auct.), Proc. Acad. Nat. Sci. Phila., 1901, p. 288. [Somaliland or Gallaland; no exact data.]

The individual recorded by the author in the above-mentioned paper is seen on second examination to be distinct from *reyi*, and appears to be identical with Kirby's *phillipsi*. A few discrepancies exist, how-

ever, in the measurements, the posterior femora of the type being eleven millimeters shorter than that of the specimen collected by Dr. A. Donaldson Smith, in the collection of the Academy.

Genus **BACTRODODEMA** Stål.

1859. *Bactrododema* Stål, Öfver. K. Vetensk.-Akad. Förhandl., 1858, p. 308.

Type.—*B. tiarata* Stål.²³

Bactrododema miliaris Bolivar?

1890. *B[actrododema] miliaris* Bolivar, Jornal Sci. Math. Phys. Nat. Acad. Real Sci., Lisboa, 2a ser., I, p. 87. [San Thomé, West Africa.]

One female; Gaboon river, West Africa. (Dr. Henry A. Ford.) [A. N. S. Phila.]

This specimen does not wholly agree with Bolivar's description of the species, differing in the bowed median and posterior femora, in which respect it approaches *B. welwitschi* Bolivar (*ibid.*, p. 88) from Golungo Alto, but from that is separated by the character of the cephalic spines and the longer wings. Westwood's *astuans* appears to be a very distinct form.

Genus **TIRACHOIDEA** Brunner.

1893. *Tirachodea* Brunner, Ann. Mus. Civ. Stor. Nat. Genova, 2a ser., XIII, p. 83.

Included *Phibalosoma cantori* Westwood, *Ph. hypharpax* Westw., *Ph. tiarchus* Westw. and *Cyphocrania tamyris* Westw., of which the first, *cantori*, may be taken as the type, as both sexes are known.

Tirachodea cantori (Westwood).

1859. *Phibalosoma Cantori* Westwood, Cat. Orth. Ins. Brit. Mus., I, p. 74, Pl. XXXVII, fig. 1 (♂), and Pl. XXXVIII, fig. 1 (♀). [Malacca.]

One male; Trong, Lower Siam. (Dr. W. L. Abbott.) [U. S. N. M.]

This specimen agrees perfectly with Westwood's figure, except that the ninth abdominal segment is very slightly shorter and the two arms of the same less curved.

²³ As some orthopterists do not recognize this genus as distinct from *Palophus* Westwood, and both names being ostensibly published in 1859, the author examined the works containing each, to ascertain, if possible, which had priority. Stål's work was presented for publication in 1858, but obviously did not appear until 1859, the copy of the work in the library of the Academy having been received May 22, 1860; and while the *Proceedings of the Entomological Society of London* give no clue as to the date of receipt of the 1858 volume, the 1859 volume is stated to have been received during 1860. Assuming the numbers to have appeared regularly, this would place the 1858 portion as appearing during 1859. Westwood's work, bearing the date June 1, 1859, on the Preface, was received at the Academy January 10, 1860, but is not mentioned in the *Proceedings of the Entomological Society of London* until August 6, 1860. In the *Proceedings of the Boston Society of Natural History*, the 1858 *Öfversigt* is entered as received between April and June 30, 1860. From the above it will be seen that the dates of publication are very close, and the question of priority is one I am unable to settle at present.

Genus **ORXINES** Stål.

1875. *Orxines* Stål, Recensio Orthopterorum, III, pp. 43 and 87.

Included *Phasma* (*Lopaphus*) *macklottii* Haan, *Anophelepis xiphias* Westwood, and *Necroscia zeuxis* Westwood; of which *xiphias* may be selected as the type, as Westwood has given good figures of both sexes.

Orxines xiphias (Westwood).

1859. *Anophelepis Xiphias* Westwood, Cat. Orth. Ins. Brit. Mus., I, p. 71, Pl. IV, fig. 4 (♂) and fig. 5 (♀). [Amboina.]

Four specimens; one male, three females; Island of Obi, Moluccas. [Coll. of Mr. Morgan Hebard and Acad. Nat. Sci. Phila.]

These specimens differ slightly from Westwood's figures, the mesonotum and metanotum (without the median segment) being slightly longer, but the discrepancies are so slight it would be very difficult to satisfactorily differentiate them from the Amboina form.

Subfamily **NECROSCINÆ**.Genus **SOSIBIA** Stål.

1875. *Sosibia* Stål, Recensio Orthopterorum, III, pp. 42 and 87.

Type.—*S. nigrispina* Stål.

Sosibia nigrispina Stål.

1875. [*Sosibia*] *nigrispina* Stål, Recensio Orthopterorum, III, p. 87. [Malacca.]

One female; Trong, Lower Siam. (Dr. W. L. Abbott.) [U. S. N. M.]

This specimen, which otherwise agrees very well with Stål's description, has the cephalic spines with more greenish than blackish coloration. The median tibiæ are exceptionally short, but Stål makes no mention of this rather striking condition.

Genus **CALVISIA** Stål.

1875. *Calvisia* Stål, Recensio Orthopterorum, III, pp. 42 and 87.

Included *Necroscia sangarius*, *medora*, *viribis* and *hemus* Westwood, of which the first can be selected as the type.

Calvisia viridilineata (Bates).

1866. *Necroscia viridilineata* Bates, Trans. Linn. Soc. London, XXV, p. 352. [Ceram.]

One female; Island of Obi, Moluccas. [Coll. of Morgan Hebard.]

This agrees perfectly with Bates' description, except that the general tint of the limbs is more brownish than greenish, but this of course may be due to drying. Stål's *maculiceps* and *thisbe* from the Philippines²⁴ appear to be closely related to this species.

²⁴ Öfversigt af K. Vetensk.-Akad. Förhandlingar, 1877, No. 10, p. 42.

Calvisia graminea (Bates).

1866. *Necrosia graminea* Bates, Trans. Linn. Soc. London, XXV, p. 356.
 [Batchian.] (♀)
 1866. *Necrosia smaragdula* Bates, Trans. Linn. Soc. London, XXV, p. 357.
 [Gilolo and Batchian.] (♂)

Eight specimens; four males, four females; Island of Obi, Moluccas. [A. N. S. Phila. and collection of Morgan Hebard.]

It appears to me that the above names were based on different sexes of the same species. The specimens examined agree almost absolutely with the descriptions, and such characters as the annulation of the antennæ and the structure of the pronotum and the head, as well as the extent of the rugosity of the mesonotum, are identical in the two sexes. Bates says the tegmina of the male "are of a yellowish colour, brown towards their tips, but sometimes uniform yellow." All the four males examined have the coloration uniform.

The rugosity of the mesonotum of both sexes is distinctly more pronounced anteriorly, which also holds true regarding the mesosternum.

The range of this species now covers Gilolo, Batchian and Obi, of the Moluccan group.

Calvisia maculicollis (Westwood).

1848. *Phasma (Necrosia) maculicollis* Westwood, Cabinet Orient. Entom., Pl. XXXVIII, fig. 2. [Assam and Sylhet.]
 1893. *Calvisia atrosignata* Brunner, Ann. Mus. Civ. Stor. Nat. Genova, XXXIII, p. 85, tab. III, fig. 27. [Bhamò, Burma and Meetan, Tenasserim.]

One female; Trong, Lower Siam. (Dr. W. L. Abbott.) [U. S. N. M.]

After critically examining the figures of Westwood's *maculicollis* and Brunner's *atrosignata*, there appears to be no doubt but that they are based on the same species. Brunner's specimens are described as being more uniform in the coloration of the costal portion of the wings, but the Trong specimen agrees exactly with Westwood's figure.

This species has been recorded from Java by Westwood and Sumatra by Brunner, as well as from the localities mentioned above.

Calvisia nigrofasciata (Haan).

1842. *P[hasma] (Necrosia) nigrofasciatum* Haan, Verhandl. Natuurlijke Geschied. Nederl. overzees. Bezitt., Orth., p. 122. [Batang Singalang.]

One male; Goenong Soegi, Lampong, Sumatra. October–November, 1901. (A. C. Harrison, Jr., and Dr. H. M. Miller.) [A. N. S. Phila.]

This specimen agrees very well with Haan's very brief description. A peculiar coloration not noticed in the original diagnosis is the longitudinal black and greenish-white lined limbs and antennæ.

Genus **MARMESSOIDEA** Brunner.

1893. *Marmessoidea* Brunner, Ann. Mus. Civ. Stor. Nat. Genova, XXXIII, pp. 84 and 85.

Included *marmessus* Westwood and *rubescens* Saussure, of which the former was considered the type by Brunner (*vide supra*, p. 86).

Marmessoidea marmessus (Westwood).

1859. *Necrosia Marmessus* Westwood, Cat. Orth. Ins. Brit. Mus., I, p. 149, Pl. XIX, figs. 1 and 7, Pl. XXIX, fig. 4. [Malacca; Sarawak, Borneo; Sumatra.]

Four specimens: two males, two females; Trong, Lower Siam. (Dr. W. L. Abbott.) [U. S. N. M.] Goenong Soegi, Lampong, Sumatra. October–November, 1901. (A. C. Harrison, Jr., and Dr. H. M. Hiller.) [A. N. S. Phila.]

The male from Sumatra has the maculations of the tegmina circular, as in the form provisionally named *curybates* by Westwood. The two Trong specimens are both typical individuals.

Marmessoidea cercyon (Westwood).

1859. *Necrosia cercyon* Westwood, Cat. Orth. Ins. Brit. Mus., I, p. 146, Pl. XXXIV, fig. 1. [Pulo Penang, Malacca.]

One female; Khow Sai Dow, Trong, Lower Siam (1,000 feet). January–February, 1899. (Dr. W. L. Abbott.) [U. S. N. M.]

As the female of this species has never been described, a few notes on the abdominal appendages and the measurements may be of interest.

Ninth dorsal segment strongly tectate, the median ridge very prominent, apex bluntly angulate. Cerci subequal, apically blunt, very slightly exceeding the apex of the subgenital opercule. Subgenital operculeymbiform, acuminate; apex very deeply and narrowly emarginate.

Measurements.

Total length,	76.3 mm.
Length of pronotum,	4 "
Length of mesonotum,	13.5 "
Length of abdomen,	41 "
Length of tegmina,	7.2 "
Length of wings,	44 "
Length of anterior femora,	21 "
Length of anterior tibiæ,	22 "
Length of median femora,	13.5 "
Length of posterior femora,	19.5 "

Marmessoidea phluctainoides²⁵ n. sp.

Types.—♂ and ♀; Yokohama, Japan. (Rev. H. Loomis.) [Coll. A. N. S. Phila. (types) and A. N. Caudell.]

²⁵ ολυκταινοειδής, i. e., pimply.

Allied to *M. sumatrensis* Brancsik²⁶ from Sumatra, but differing in the shorter mesonotum, the compressed ninth abdominal segment, the non-annulate antennæ and the different color pattern of the tegmina. Brancsik's *Necroscia papuana* from New Guinea and Westwood's *ismene* from Borneo are apparently related to *phluctainoides*, but very distinct species.

♂.—Size rather small; form slender; surface of head subglabrous, of thoracic segments granulose. Head rather large, moderately depressed, somewhat inflated, the posterior portion subequal in width, occiput with a faint median sulcus; eyes ovate, prominent; basal joint of the antennæ slightly depressed, longer than broad, second joint longer than broad and not equal to the basal joint in size, total length of the antennæ about equal to that of the abdomen. Pronotum quadrate, with a fine median longitudinal sulcus and a well-marked transverse sulcus which is placed before the middle. Mesonotum somewhat over three times the length of the pronotum, subequal anteriorly, slightly expanded posteriorly, very distinct median and lateral carinæ present, all becoming rather evanescent posteriorly, surface rugosotuberculate. Tegmina short, subtruncate apically, raised portion of moderate elevation, rounded. Wings large, damaged in the type, but apparently reaching the apex of the abdomen in the perfect specimen. Abdomen slender, the six basal segments longitudinal and slightly decreasing in length apically; eighth segment slightly longer than the seventh, both carinate, the seventh slightly expanded apically, the eighth slightly compressed; ninth segment about equal to the seventh in length, compressed, subtectate, apex truncate when viewed from the dorsum; cerci about reaching to the apex of the ninth segment, subequal, slightly incurved; supra-anal plate absent; subgenital opercule reaching to the apex of the eighth dorsal segment, rotundatotruncate. Anterior femora somewhat exceeding the pronotum and mesonotum in length, considerably curved basally; tibiæ slightly shorter than the femora; metatarsi very slender, equal to the remaining tarsal joints in length. Median and posterior limbs absent.

General color purplish-brown, rather pale on the proximal portion of the anterior femora. Tegmina with the elevation black, bordered laterally by a longitudinal bar of pinkish-white, which extends to the apex of the tegmina. Wings pinkish-purple.

♀.—Size medium; form rather robust; surface of mesonotum and tegmina rugose. Head inflated, slightly elongate; eyes ovate, mod-

²⁶ *Jahresheft des Naturwissenschaftlichen Vereines des Trieneser Comitales*, XIV-XV, p. 201, tab. xi, fig. 11 (♂).

erately prominent; antennæ slightly exceeding half the length of the body, basal joint longitudinal and considerably depressed, second joint cylindrical, considerably smaller than the basal joint. Pronotum quadrate, very slightly constricted posteriorly, anterior margin with a shallow emargination, median sulcus not marked posteriorly, the transverse ante-median sulcus very distinct. Mesonotum equal in length to the posterior tibiæ, rather broad, gradually expanding posteriorly; median and lateral carinæ very distinct; surface rugoso-tuberculate. Tegmina short, subquadrate; apex subtruncate; elevated point slight, low and rounded. Wings short, reaching to the apex of the third abdominal segment, width about three-fourths of the length; costal area coarsely reticulate; radial vein furcate. Abdomen somewhat inflated, the six basal segments all transverse and subequal in length, the second and third of the greatest and the sixth of the least width; seventh and eighth segments tectate, subequal in length; ninth segment slightly longer than the eighth, the apex somewhat produced, truncate and with a slight triangular median emargination; supra-anal plate with the apex alone visible; cerci straight, reaching to the apex of the ninth segment; subgenital opercule tectate, acuminate, the tip acute and reaching to the apex of the eighth segment. Egg almost ready to deposit in position in oviduct, general shape apparently oval, surface rugose. Limbs short, terminal tarsal joint of each foot provided with a large arolium. Anterior femora slightly exceeding the mesonotum in length, basal section strongly bowed; tibiæ slightly shorter than the femora; metatarsi slightly shorter than the remaining tarsal joints. Median femora and tibiæ short, the former slightly longer than the latter, neither exceeding the length of the two basal segments of the abdomen; metatarsi considerably shorter than the remaining joints of the tarsi. Posterior femora but slightly shorter than the pronotum and mesonotum together; tibiæ slightly shorter than the femora; metatarsi much shorter than the remaining tarsal joints, the second joint alone being half the length of the metatarsus.

General color grass-green, most intense on the mesonotum, tegmina and costal region of the wings. Antennæ dull purplish, pale basally; eyes wood-brown, with a narrow longitudinal bar of darker brown; postocular region with a faint line of yellowish. Mesonotum with the lateral carinæ chrome-yellow. Tegmina with the chrome-yellow line of the mesonotum continued to the apical margin, flanked internally by a line of blackish. Wings with the posterior portion roseate-pink.

Measurements.

	♂	♀
Total length,	40 mm.	50 mm.
Length of pronotum,	1.7 "	2.5 "
Length of mesonotum,	7 "	10 "
Length of tegmina,	2.5 "	3 "
Length of wings,	19+ "	16.5 "
Length of abdomen,	22.5 "	26.5 "
Length of anterior femora,	11 "	11.5 "
Length of anterior tibiae,	9.5 "	9.5 "
Length of median femora,		7.5 "
Length of posterior femora,		11.7 "

This species is based on a series of sixteen individuals, fifteen of which are females. No appreciable difference exists in all the series, except in the intensity of the green coloration of the body, which is clearly due to the fading of the natural tint.

Genus **SIPYLOIDEA** Brunner.

1893. *Sipyloidea* Brunner, Ann. Mus. Civ. Stor. Nat. Genova, XXXIII, pp. 84 and 86.

Included *Necroscia chlorotica* Serville, *N. sipylus*, *samsoo*, *sarpedon* and *panætius* Westwood, of which Brunner selected *sipylus* as the type.

Sipyloidea sipylus (Westwood).

1859. *Necroscia Sipylus* Westwood, Cat. Orth. Ins. Brit. Mus., I, p. 138, Pl. XVIII, fig. 4. [Assam; Java.]

Three specimens; one male, two females; Trong, Lower Siam. (Dr. W. L. Abbott.) [U. S. N. M.]

This species has been recorded from Bhamò and Carin Chebà, Burma, Assam, Malacca, Sumatra, Java and Borneo. The form from the latter island was provisionally separated by Westwood as *warasaca*.

Sipyloidea scabra (Stål)?

1877. *Necroscia scabra* Stål, Öfversigt af K. Vetensk.-Akad. Förhandlingar, 1877, No. 10, p. 43. [Philippines.]

Two males; Island of Obi, Moluccas. [Coll. of Morgan Hebard and A. N. S. Phila., presented by Mr. Hebard.]

These specimens agree fairly well with Stål's very brief description, but that individuals from the two localities are identical is, to say the least, doubtful. A very peculiar feature of these individuals is the continuous ventral line extending from the prosternum to the apical portion of the abdomen. Several other species related to this form are *sarpedon* and *samsoo* Westwood, and possibly *janus* Bates and *cramia* Westwood.

*Sipylloidea pœcilopectera*²⁷ n. sp.

Types.—♂ and ♀; Island of Obi, Moluccas. [A. N. S. Phila., presented by Mr. Morgan Hebard.]

As this species does not appear to be closely related to any of the previously known species, I have compared it with the type of the genus. The new form differs from *S. sipylus* in the smaller size, the very weak character of the granulations on the mesonotum, the somewhat slenderer and less coriaceous tegmina, the blunter character of the apex of the ninth dorsal abdominal segment and the more acuminate apical portion of the subgenital opercule.

♂.—Size medium; form elongate; surface smooth. Head slightly oblong, dorsal surface flat, the occiput with a slight median longitudinal sulcus; eyes ovate, prominent; antennæ slightly exceeding the body in length. Pronotum longitudinal, about twice as long as broad, subequal in width, transverse sulcus in advance of the middle. Mesonotum about three and a half times the length of the pronotum, very slender, very slightly constricted centrally; surface with a few obsolete granulations and a weak longitudinal median carina. Tegmina ovate, the apex sub-truncate, median protuberance of medium height and rather blunt. Wings equal to the mesonotum and about two-thirds the abdomen in length. Abdomen with the seventh and eighth segments subequal in length, and exceeding the ninth, which is somewhat tectate and apically subtruncate with a very shallow median emargination; cerci short, stout, subequal, extending but slightly beyond the ninth dorsal segment; subgenital opercule not quite reaching the apex of the eighth dorsal segment, moderately compressed, apex rather broadly rounded. Limbs very slender. Anterior femora equal to about half the length of the abdomen, basal flexure slight; tibiæ about equal to the femora in length; metatarsi considerably exceeding the remaining joints in length. Median femora equal to the mesonotum and tegmina in length; tibiæ slightly shorter than the femora in length; metatarsi very slightly longer than the remaining tarsal joints. Posterior femora about equal to the anterior femora in length; tibiæ equal to the femora in length; metatarsi exceeding the remaining tarsal joints in length.

♀.—Size medium. Head suboval, not constricted posterior to the eyes; occiput with a distinct longitudinal median sulcus; eyes ovate; antennæ about two-thirds the length of the body. Pronotum as in the male, but the transverse sulcus is not so anterior in position. Mesonotum three times the length of the pronotum, slightly expanding posteriorly, median carina very fine, subobsolete. Tegmina ovate,

²⁷ ποικίλοπτερος—variegated wings.

the apex somewhat truncate; costal region very broadly areuate; median protuberance longitudinal, low and rounded. Wings equal to the abdomen in length; when in repose the tips are distinctly acuminate. Abdomen with the seventh, eighth and ninth dorsal segments subequal in length, the latter subtectate and distinctly acuminate; subgenital opercule acuminate, reaching to the middle of the ninth dorsal segment. Anterior femora slightly compressed, almost equal to the head, pronotum and mesonotum in length; tibiæ slightly shorter than the femora. Median femora equal to the mesonotum and half of the pronotum in length; tibiæ about five-sixths the length of the femora; metatarsi but slightly shorter than the remaining tarsal joints. Posterior femora about as long as the head, pronotum and mesonotum; tibiæ equal to the femora.

General color pea-green, dark dull in the female. Antennæ greenish-brown, with the base of each joint encircled by a narrow whitish annulus, this latter character more apparent in the male than in the female. Pronotum in the male flecked with small circular blotches of cream. Tegmina and costal region of wings pea-green, in the female the tips of the latter touched with rosy red; posterior field of the wings pale pinkish. Apex of the abdomen and portions of the limbs in the female washed with rosy red.

Measurements.

	♂		♀	
Length of body,	57	mm.	73	mm.
Length of pronotum.	3	"	4	"
Length of mesonotum.	10.5	"	12.5	"
Length of abdomen,	35	"	44	"
Length of tegmina,	3.5	"	5.5	"
Length of wings,	30	"	44.5	"
Length of anterior femora,	19.2	"	19	"
Length of anterior tibiæ,	18.2	"	18.5	"
Length of median femora,	13	"	15	"
Length of posterior femora,	18	"	19.5	"

Genus **ARUANOIDEA** Brunner.

1893. *Aruanoidea* Brunner, Ann. Mus. Civ. Stor. Nat. Genova, XXXIII, p. 84.

Included *salmanazar*, *aruana* and *osmylus* of Westwood, of which *aruana* may be considered the type.

Aruanoidea aruana (Westwood)†

1859. *Necroscia Aruana* Westwood, Cat. Orth. Ins. Brit. Mus., I, p. 134, Pl. XXXIX, fig. 4. [Aru Islands.]

Fifteen specimens; eleven males, four females; Island of Obi, Moluccas. [Coll. of Mr. Morgan Hebard and A. N. S. Phila., presented by Mr. Hebard.]

This species has two well-marked color phases, one pea-green, the other dull wood-brown. The males all belong to the latter phase, and have the internal edge of the tegmina and the internal edge of the basal portion of the wings with a rather broad longitudinal bar of dull yellowish.

The following description is of the male, which appears never to have been recorded.

Size medium; form elongate; surface granulose. Head somewhat depressed, posterior portion of subequal width; occiput with a very deep longitudinal sulcus; eyes subovate; ocelli distinct; antennæ equal to the body in length. Pronotum distinctly longitudinal, twice as long as broad; anterior margin broadly emarginate, posterior margin broadly arcuate, lateral margins bearing a rather acute process anteriorly; transverse sulci two in number, one immediately posterior to the anterior margin, the other just anterior to the middle. Mesonotum distinctly tuberculate (a condition shared by the meso- and metasternum and pleura), slender, subequal; median carina rather broad, low. Tegmina subpyriform, apex obliquely truncate; costal field subequal in width; median protuberance very distinct. Wings about twice the length of the head, pronotum and mesonotum together. Abdomen with the seventh and eighth dorsal segments subequal in length, carinate, the ninth slightly shorter than the eighth, apical emargination very deep, expanded, the lateral portions incurved and enclosing the expanded sinus; cerci subequal in width, not quite equal to the ninth segment in length; subgenital opercule reaching to the tip of the eighth dorsal segment, cymbiform, apex narrowly rounded. Anterior femora with the basal flexure moderately distinct, equal to the head, pronotum, mesonotum and tegmina in length; tibiæ equal to the femora in length; metatarsi nearly twice as long as the following tarsal joint. Median femora equal to the pronotum and mesonotum in length; tibiæ somewhat shorter than the femora; metatarsi about equal to the remaining tarsal joints in length. Posterior femora and tibiæ about equal to the anterior in length; metatarsi slightly longer than the remaining tarsal joints.

General color dull wood-brown, blotched and suffused with dull ochraceous, the limbs obscurely annulate. Tegmina with a spot on the median protuberance and the internal border as well as the adjoining portion of the wings dull yellow; posterior field of wings vinaceous. Antennæ dull brownish-ochraceous with obsolete annuli of a dark brown.

Measurements.

Total length,	61 mm.
Length of pronotum,	3.5 "
Length of mesonotum,	10 "
Length of abdomen,	38 "
Length of tegmina,	4 "
Length of wings,	34 "
Length of anterior femora,	19.5 "
Length of anterior tibiae,	19.5 "
Length of median femora,	13.5 "
Length of posterior femora,	18.5 "

This locality extends the range of the species considerably to the westward.

***Aranoidea punctata* (Gray).**

1835. *Platyserana punctata* Gray, Synopsis Phasm., p. 37. [East Indies.]

Two males; Trong, Lower Siam. (Dr. W. L. Abbott.) [U. S. N. M.]

These specimens are identical in the pattern and intensity of the coloration.

Subfamily CLITUMNINÆ.

Genus **MACELLA** Stål.

1875. *Macella* Stål, Recensio Orthopterorum, III, pp. 13, 70.

Included *Bacillus souchongia* Westwood and *Macella dentata* Stål. of which the former may be considered the type as it is well figured.

Macella caulodes²⁸ n. sp.

Types.—♂ and ♀; Trong, Lower Siam. (Dr. W. L. Abbott.) [Cat. No. 7,345, U. S. N. M.]

Apparently not closely allied to any of the previously known species of the genus; the unarmed character of the eighth abdominal segment and the rather straight cerci are very distinctive.

♂.—Size rather small; form elongate; surface subsericeous. Head elongate, somewhat depressed, evenly constricted posteriorly; eyes subglobose, rather prominent; antennæ with the first joint elongate-ovate, depressed, median longitudinal portion rounded, half the length of the linear second joint. Pronotum longitudinal; anterior margin broadly emarginate; posterior margin truncate; lateral margins with the anterior half broadly and evenly emarginate, median longitudinal carina distinct. Mesonotum over five times the length of the pronotum, very slender, median carina distinct anteriorly. Metanotum (with median segment) about three-fourths the length of the mesonotum; median segment very short, transverse. Abdomen with the

²⁸ *καυλωδης*, i.e., resembling a stem.

first to sixth segments distinctly longitudinal; seventh dorsal segment not more than two-thirds the length of the sixth; eighth segment tectate, slightly shorter than the seventh, lateral portions with the posterior angles simple and not developed into distinct spines; ninth segment slightly shorter than the eighth, fornicate, apically truncate and with a transverse costa, median carina narrow and distinct; cerci about equal in length to the ninth dorsal segment, and inserted near the apex of the latter, slender, hardly curved; subgenital opercule not quite reaching the apical margin of the eighth dorsal segment, apex broad, truncate. Limbs very slender. Anterior femora but slightly shorter than the mesonotum and metanotum together, basal flexure slight; tibiæ slightly longer than the femora, very slender; metatarsi nearly three times the length of the remaining joints of the tarsi. Median femora slightly exceeding the pronotum and mesonotum in length, slightly bowed, tibiæ slightly longer than the femora, metatarsi about half again as long as the remaining tarsal joints. Posterior femora equal to the five basal abdominal segments in length, slightly bowed; tibiæ exceeding the femora by about the length of the first abdominal segment; metatarsi considerably over twice as long as the remaining tarsal joints.

♀.—Size rather small; form moderately slender; surface generally subsericeous, rather granulose on the mesonotum. Head elongate, depressed, very slightly compressed posteriorly, posterior margin with a distinct narrow median depression; eyes subglobose; antennæ almost equal to the head and pronotum in length, basal joint as in the male, the second joint rather stout. Pronotum similar to that of the male. Mesonotum slightly more than four times the length of the pronotum, very slightly and very gradually enlarging posteriorly; median carina anteriorly distinct, but very narrow, and becomes obsolete posteriorly. Metanotum (with median segment) two-thirds the length of the mesonotum; median carina as in the mesonotum; median segment very short, decidedly transverse. Abdomen equal to the head and thorax in length, median carina distinct and becoming quite prominent posteriorly, where the segments are decidedly tectate; first to sixth segments longitudinal, the length increasing from the base; seventh segment longitudinal, the apical portion considerably expanded; eighth segment somewhat transverse, carina not very distinct; ninth segment moderately produced, strongly carinate, apical margin with a median triangular emargination, which exposes the acuminate apex of the supra-anal plate; cerci acuminate, extending beyond the ninth dorsal segment by about two-thirds the length of the latter; subgenital opercule

reaching to the apical margin of the eighth dorsal segment, apex rotundato-truncate. Anterior femora equal to the head, pronotum and mesonotum in length, moderately compressed, basal flexure distinct; tibiæ slightly shorter than the femora; metatarsi about three times the length of the remaining tarsal joints. Median femora almost equal to the pronotum and mesonotum in length; tibiæ slightly exceeding the femora in length; metatarsi not quite twice the length of the remaining tarsal joints. Posterior femora exceeding the four basal segments of the abdomen in length, somewhat bowed; tibiæ slightly longer than the femora; metatarsi twice as long as the remaining tarsal joints.

General color dull ochraceous-brown, deeper in the male than in the female and also exhibiting some trace of greenish. Head with a post-ocular streak of blackish-brown more or less evident.

Measurements.

	♂	♀
Total length,	51 mm.	54 mm.
Length of pronotum,	2 "	2.2 "
Length of mesonotum,	12 "	13 "
Length of metanotum (including median segment),	9.5 "	9 "
Length of median segment,	1.2 "	1.5 "
Length of abdomen,	25.5 "	26.2 "
Length of anterior femora,	21.7 "	17 "
Length of anterior tibiæ,	22.7 "	16.5 "
Length of median femora,	14.5 "	12.2 "
Length of posterior femora,	18 "	14.2 "

Another Trong specimen, a female, I have provisionally referred to this species. However, it exhibits several discordant characters, as the antennæ beyond the second joint are slenderer, the terminal segments of the abdomen are supplied with longitudinal rugæ, and the size is greater.

Genus **GRATIDIA** Stål.

1875. *Gratidia* Stål, Recensio Orthopterorum, III, pp. 14, 70.

Type.—*Gratidia sansibara* Stål.

As the material studied in this connection was quite limited, no attempt has been made to determine the propriety of uniting *Clonaria* with *Gratidia*, as Karsch has proposed to do in his paper on this genus.²⁹ The relegating of *Paraclonaria* to the synonymy seems unwarranted, in spite of the arguments Karsch advances in defense of his action. The structural characters of *Paraclonaria* are of sufficient importance

²⁹ *Entom. Nachricht.*, XXIV, pp. 370-380.

to place it on an equal footing with many recognized genera of Phasmidæ.

Gratidia natalis (Westwood).

1859. *Bacillus Natalis* Westwood, Cat. Orth. Ins. Brit. Mus., I, p. 6, Pl. XXIII, figs. 7 and 8. [Port Natal.]

One female; Zulu Mission, South Africa. [A. N. S. Phila.]

This specimen is from alcohol, and in consequence badly shriveled and distorted.

Gratidia inclinata Karsch.

1898. [*Gratidia*] *inclinata* Karsch, Entom. Nachricht., XXIV, pp. 372, 375. [Darema, Usambara, German East Africa.]

Three males; Mombasa, British East Africa. [Coll. of Morgan Hebard.]

These specimens have been badly broken, but they appear to be clearly referable to this species.

Genus **PARACLONARIA** Schulthess-Schindler.

1893. *Paraclonaria* Brunner, Ann. Mus. Civ. Stor. Nat. Genova, XXXIII, p. 89. [Name untenable, as no included species are cited.]

1898. *Paraclonaria* Schulthess-Schindler, Ann. Mus. Civ. Stor. Nat. Genova, XXXIX, p. 182.

Included *P. longelaminata*, *affinis* and *hamuligera* Schulthess, the first of which was removed to *Phthoa* by Karsch. Of the remaining forms *hamuligera* may be selected as the type.

Paraclonaria postrostrata (Karsch).

1898. [*Gratidia*] *postrostrata* Karsch, Entom. Nachricht., XXIV, pp. 373, 378. [Mombasa, East Africa.]

Two males; Mombasa, British East Africa. [Coll. Morgan Hebard.]

These specimens agree very well with Karsch's description, except for the fact that he gives the length of the anal segment as 7.5 millimeters, while in the specimens examined the plate itself is considerably shorter than the type measurements. Possibly personal equation or a different comprehension of the "analsegment" may be responsible for the difference, as the structure and other proportions agree perfectly.

Genus **MARANSIS** Karsch.

1898. *Maransis* Karsch, Entom. Nachricht., XXIV, pp. 365, 381.

Type.—*Bacillus mozambicus* Westwood.

Maransis rufolineatus Schulthess.

1899. *M[aransis] rufolineatus* Schulthess, Bull. Soc. Vaudoise Sci. Nat., Lausanne, XXXV, p. 200, Pl. VII, fig. 4. [Delagoa.]

Five specimens; two males, three females (two immature); Zulu Mission, South Africa. [A. N. S. Phila.]

Genus **PARAPACHYMORPHA** Brunner.

1893. *Parapachymorpha* Brunner, Ann. Mus. Civ. Stor. Nat. Genova, XXXIII, p. 95.

Included *P. nigra* and *spinosa* Brunner.

NEOHIRASEA³⁰ n. subgen.

Allied to *Parapachymorpha* s.s., but differing in the greater size of the second antennal joint, the unarmed limbs, the transverse first abdominal segment, the emarginate ninth dorsal segment, as well as the accentuated character of the major body spines and the comparative suppression of the minor ones.

Type.—*Pasma* (*Acanthoderus*) *japonicum* Haan.

Parapachymorpha (**Neohirasea**) **japonica** (Haan).

1842. *Pasma* (*Acanthoderus*) *japonicum* Haan, Verhandl. Natuurlijke Geschied., Orth., p. 135, tab. 12, fig. 4. [Japan.]

Three females; Kyoto, Japan. (Y. Hirase, No. 48.) [A. N. S. Phila.]

Nikko, Japan. [U. S. N. M.]

The Nikko specimen, while badly broken, represents an individual considerably bulkier than either of the Kyoto specimens.

Subfamily **ACROPHYLLINÆ**.³¹Genus **DIMORPHODES** Westwood.

1859. *Dimorphodes* Westwood, Cat. Orth. Ins. Brit. Mus., I, p. 80.

Type.—*D. prosthesis* Westwood.

Dimorphodes **mancus** Bates.

1856. *Dimorphodes mancus* Bates, Trans. Linn. Soc. London, XXV, p. 345, Pl. XLIV, figs. 3 and 8. [Batchian and Ternate.]

Thirteen specimens; eight males, five females; Island of Obi, Moluccas. [Coll. of Morgan Hebard.]

In this fine series of specimens two individuals, one a male and the other a female, are decidedly more spinose than the remainder of the series. This is almost wholly due to the development of the low tuberculous excrecences of the other specimens into distinct spines, and may be considered a purely individual feature. Considerable discrepancy exists in the length of the anterior limbs, two undoubtedly

³⁰ Dedicated to Mr. Y. Hirase, of Kyoto, Japan, who has devoted a great amount of time and labor to collecting representatives of the Mollusca and Orthoptera of his native land.

³¹ As Kirby has already noticed (*Proc. Royal Dublin Soc.*, n. s., VI, p. 573), *Acrophylla* and *Diura* are directly synonymous. The former name was proposed to replace the latter, which is preoccupied. Accordingly the use of the names as distinct genera is a gross error.

adult individuals showing the range of variation in the length of the femora to be 4.5 millimeters.

Genus **GRAEFFEA** Stål.

1875. *Graeffea* Stål, Recensio Orthopterorum, III, pp. 40, 85.

Type.—*Lopaphus cocophagus* Westwood (= *Alopus cocophages* Newport).

Graeffea cocophages (Newport).

1844. *Alopus cocophages* Newport, Philosoph. Trans. Royal Soc. London, 1844, Pt. I, p. 288, Pl. XIV, fig. 4. [Navigator's Island.]

Three specimens; one male, two females; Savaii, Samoan Islands. (Sir Charles Eliot.) [U. S. N. M.]

This species has also been recorded from the Tonga group, the Feejees, and Rotuma near the latter group. The Loyalty Islands possess another species of the genus, *lifuensis* Sharp, and possibly *fulvescens* Saussure, from the Marquesas, may be distinct, as the cerci of the female are subspatulate instead of acuminate or terete, as in the other two forms of the genus.

Genus **ARRHIDÆUS** Stål.

1875. *Arrhidæus* Stål, Bihang till K. Svenska Vet.-Akad. Handl., Bd. 2, No. 17, p. 15.

Type.—*Necroschia styxius* Westwood.

This genus contains a number of Oriental and Papuan species, a list of which may prove of service:

Arrhidæus styxius (Westwood). Philippines.

Arrhidæus palinurus (Westwood). Philippines.

Arrhidæus nigricornis Stål. Philippines.

Arrhidæus stali Kirby. Albay, N. E. Luzon, Philippines.

Arrhidæus capito (Westwood). Sarawak, Borneo.

Arrhidæus longiceps (Bates). Kaioa Island, near Batchian.

Arrhidæus apalamnus n. sp. Obi.

Arrhidæus roscus (Stoll). Amboina and Ceram.

Arrhidæus cephalotes (Bates). New Guinea.

?*Arrhidæus vittatus* (Serville). Java.

Arrhidæus apalamnus³² n. sp.

Types.—♂ and ♀; Island of Obi, Moluccas. [A. N. S. Phila., presented by Mr. Morgan Hebard.]

Near *longiceps* Bates,³³ but differing in the longer pronotum, shorter tegmina and wings, distribution of the femoral spines and coloration.

³² ἀπαλάμνος, i.e., helpless.

³³ *Trans. Linn. Soc. London*, XXV, p. 350, Pl. XLV, fig. 6.

Stoll's description of *rosea*,³⁴ from Amboina is so brief that even with the aid of his figure little can be made out of it. It is very apparent, however, that it has much longer wings than *apalamnus*, which latter has very short wings in both sexes.

♂.—Size rather small; form moderately elongate; surface glabrous. Head very large, almost twice the width of the pronotum, oblong, slightly and evenly constricted in the posterior portion; occiput with a broad shallow longitudinally disposed sulcus, another of similar character extending posteriorly from the eye and another on the side of the head; ocelli obsolete; eyes hemispherical; antennæ slender, filiform, about equal to the anterior femora in length. Pronotum oblong, about twice as long as broad, very slightly broader anteriorly than posteriorly, transverse sulcus centrally placed, lateral portions with a broad shallow longitudinal depression extending almost the entire length. Mesonotum slender, slightly expanding anteriorly and posteriorly, over three times the length of the pronotum, surface obsoletely tuberculate; median carina replaced by a very weak sulcus. Tegmina ovate; apex rounded; median protuberance extremely low; venation very irregular and somewhat reticulate in character. Wings short, not reaching to the middle of the third abdominal segment; costal and mediastinal regions with the transverse nervures distinct and parallel. Abdomen bacilliform; eighth dorsal abdominal segment slightly longer than the seventh, both of which are somewhat tectate; ninth segment compressed, carinate, apical incision deep and circular, the inferior lateral lobes strongly dentate; cerci about equal to the ninth segment in length, filiform, apex acuminate; subgenital opercule reaching to the tip of the eighth dorsal segment, cymbiform, the apex moderately acuminate. Limbs rather slender. Anterior femora equal in length to the head, pronotum, mesonotum and tegmina, basal flexure slight, apical portion of the inferior surface with four spines; tibiæ slightly longer than the femora; metatarsi half again as long as the remaining tarsal joint. Median femora equal to the mesonotum and half of the pronotum in length, apical spines four in number, three placed anteriorly, one posteriorly; tibiæ equal to the femora in length; metatarsi slightly longer than the remaining tarsal joints. Posterior femora slightly shorter than the four basal abdominal segments, the apical spines six or seven in number, one at the extreme apex placed posteriorly; tibiæ slightly longer than the femora; metatarsi about equal to the remaining tarsal joints in length.

³⁴ *Natuurlijke Afbeeldingen en Beschrijvingen, Spoken*, pp. 13 and 76, Pl. V, fig. 17.

General color sea-green, prothoracic and mesothoracic pleura and lines on the anterior and median coxæ, as well as the posterior part of the prosternum black. Eyes wood-brown with a longitudinal bar of blackish which is continued to the posterior margin of the head. Tegmina with the median protuberance pale ochraceous. Wings with the venation of the costal and mediastinal regions of the general tint on a smoky ground; posterior field vermilion.

♀.—Size medium. Head much as in the male, but the sulci less distinct; antennæ very slender, not more than two-thirds the length of the anterior femora. Pronotum half again as long as broad, subequal in width; three moderately distinct transverse sulci in the anterior half. Mesonotum four times the length of the pronotum; median carina replaced by a very fine longitudinal sulcus. Tegmina subovate, apex rounded; median protuberance not perceptible. Wings extremely short, not quite reaching the apex of the first abdominal segment; costal and mediastinal regions with the apex subacuminate. Abdomen with the eighth dorsal segment considerably longer than the seventh; ninth segment shorter than the seventh, apex broadly acuminate; cerci not equalling the ninth segment in length, depressed, acuminate; subgenital opercule compressed, scoop-like, extending to the middle of the ninth dorsal segment, apex narrowly emarginate, surface subcoriaceous. Limbs with the femoral spines much as in the male, but much weaker. Anterior femora equal to the mesonotum and wings in length, basal flexure slight; tibiæ about equal to the femora in length; metatarsi half again as long as the remaining tarsal joints. Median femora and tibiæ subequal and each somewhat shorter than the mesonotum. Posterior femora slightly longer than the four basal joints of the abdomen; tibiæ exceeding the femora by half the length of the four abdominal segments; metatarsi slightly exceeding the remaining tarsal joints in length.

General color pale yellowish-green, becoming ochraceous on the abdomen. Head glaucous-green, with two longitudinal stripes of chrome-yellow which extend from the basal antennal joints back along the lateral margins of the pronotum and mesonotum; a postocular streak of darker green is faintly indicated. Mesonotum and pronotum scrubbled with wood-brown, the mesothoracic pleura longitudinally lined with chrome-yellow. Tegmina viridian-green, the mediastinal region chrome-yellow. Wings with the apex of the costal and discoidal region smoky-brown, with the venation rich verdigris-green; posterior field vermilion. Limbs dull yellowish lined with blackish, which also suffuses the coxæ.

Measurements.

	♂	♀
Total length,	53.5 mm.	74.2 mm.
Length of pronotum,	3 "	4.1 "
Length of mesonotum,	10.5 "	16.5 "
Length of tegmina,	4 "	4.7 "
Length of wings,	14.9 "	10 "
Length of abdomen,	30.5 "	39.5 "
Length of anterior femora,	21.5 "	28.5 "
Length of anterior tibiæ,	22.1 "	29 "
Length of median femora,	12 "	15 "
Length of posterior femora,	16 "	19.5 "

Genus **ANCHIALE** Stål.

1875. *Anchiale* Stål, Recensio Orthopterorum, III, pp. 36 and 84.

Type.—*Anchiale maculata* (Olivier) (= *Phasma nocydaloides* Stoll [not of Linn.] and *Phasma narium* Lichtenstein).

Anchiale nævia (Lichtenstein).

1787. [*Phasma nocydaloides* Stoll, Natuurlijke Afbeeldingen en Beschryvingen, Spoken, pp. 8, 10 and 76, Pl. III, fig. 8, Pl. IV, fig. 11. [Amboina.] (Not *Gryllus* (*Mantis*) *nocydaloides* Linnæus.)

1792. *Mantis maculata* Olivier, Encycl. Method., Ins., VII, p. 636. [Amboina.]³⁵ (Not of Thunberg and Lundahl, 1784.)

1802. [*Phasma narium* Lichtenstein, Trans. Linn. Soc. London, VI, p. 13. [Amboina.]]³⁵

Two rather immature females; Island of Obi, Moluccas. [Coll. of Morgan Hebard.]

One of these specimens has the right anterior limb regenerated, the whole leg not equalling the normal left femur in length. The synonymy of this species is very much involved, but after considerable study *nævia* seems to be the correct name.

Sharp³⁶ has given some space to a discussion of the names of the species of the genus, but as he did not have the Moluccan form, the question as to a name for it was left unsettled. The nominal species known to date are as follows:

Anchiale nævia (Lichtenstein). Amboina and Obi.

Anchiale stollii Sharp. New Britain.

Anchiale confusa Sharp. New Britain (Westwood credits this form, which he calls *maculata*, to the Sandwich Islands).

The insect figured and described by Blanchard³⁷ from Warou, on the coast of Ceram, may represent a distinct form.

³⁵ Based on Stoll's figures.

³⁶ Willey, *Zoological Results*, I, p. 90.

³⁷ *Voyage au Pole Sud.*, Zool., IV, p. 358. Orth., Pl. I, fig. 8.

Subfamily HETEROPTERYGINÆ (*Cladomorphinæ* Brunner).

Genus **HETEROPTERYX** Gray.

1835. *Heteropteryx* Gray, Synopsis Spec. Ins. Phasm., pp. 13 and 32.

Type.—*Pasma dilatatum* Parkinson.

Heteropteryx dilatata (Parkinson).

1798. *Pasma dilatatum* Parkinson, Trans. Linn. Soc. London, IV, p. 190, tab. 18. [Asia.]

Two specimens, male and female; Trong, Lower Siam. (Dr. W. L. Abbott.) [U. S. N. M.]

The male of this species has never been described, and appears to be remarkable for the great length of the tegmina and wings. It resembles the male of *mülleri* Haan closer than any other species the male of which is known. From *mülleri* it can readily be distinguished by the shorter mesonotum, the longer tegmina (55 mm.) and wings (70 mm.), and the more ample lateral flaps of the seventh and eighth abdominal segments.

The range of the genus *Heteropteryx* covers Malacca and Trong (*dilatata*, *castelnaudii*, *rollandi*), Sumatra (*mülleri*), Java (*rosenbergi*), Borneo (*grayii*, *dehaanii* and *dilatata*), Celebes (*westwoodii*) and Australia (*australis*).

Genus **DATAMES** Stål.

1875. *Datames* Stål, Recensio Orthopterorum, III, pp. 51 and 93.

Type.—*Acanthoderus oilcus* Westwood.

Datames æqualis³⁸ n. sp.

Type.—♀; Island of Obi, Moluccas. [A. N. S. Phila., presented by Mr. Morgan Hebard.]

Closely allied to *D. mouhotii* Bates³⁹ from Cambodia, but differing in the peculiar form of the ninth dorsal abdominal segment, and the almost entire absence of oblique ridges on the abdominal segments. The Javan and Malaccan *oilcus* Westwood, rather curiously, is not at all closely allied.

Size small; form elongate, tectate, subequal; surface obscurely tuberculate. Head subequal in width, slightly longitudinal; occiput elevated and bearing two converging cristate crenulate ridges, which, when united posteriorly, form a jagged projecting lobe; interocular region with a structure somewhat similar to that found on the occiput, but on a smaller scale, the ridges not meeting posteriorly and being trituberculate, the anterior tubercle developed into a distinct curved

³⁸ In allusion to the uniform breadth of the thoracic and abdominal segments.

³⁹ *Trans. Linn. Soc. London*, XXV, p. 342.

claw-like spine; lateral aspect of the head with a distinct longitudinal rounded ridge passing through the eye; eyes globose, rather small; antennæ equal to the mesonotum and metanotum in length, basal joint triquetrous, subconcave, rectangular, the external margin with a distinct submedian and apical spine, second joint longitudinal, depressed. Pronotum slightly transverse, anterior margin concave, posterior margin truncate; median portion with a pair of longitudinal tuberculous ridges; lateral portions with a broad distinct continuous ridge. Mesonotum two and one-half times the length of the pronotum; median carina sprinkled with tubercles, the anterior and posterior portions each bearing a distinct symmetrically disposed pair; lateral ridge distinct, gently curved upward in the supra-coxal region. Metanotum (including the median segment) two-thirds the length of the mesonotum and similar in structure, except that the anterior portion of the median carina is without tubercles; median segment slightly more than one-fourth of the whole metanotal length. Abdomen almost equal to the head and thorax in length, subequal in width, all segments transverse, the oblique lateral lines present in the other species of the genus subobsolete; median carina very distinct on the fourth and eighth segments, bifurcate on the former, cristate on the latter; ninth dorsal abdominal segment basally rectangular, the posterior median portion produced into a subtriangular process, the apex of which is truncate-emarginate; subgenital opercule reaching to the apex of the eighth dorsal segment, carinate, produced, the apex rounded. Limbs short and stout. Anterior femora about three-fourths the length of the mesonotum, basal flexure slight, but occupying half the entire length, dorsal carina high; tibiæ slightly shorter than the femora; metatarsi not exceeding the succeeding joint in length. Median femora slightly shorter than the metanotum in length, superior margin obscurely trilobate; tibiæ slightly shorter than the femora; metatarsi not different in character from the succeeding joint and but very slightly longer. Posterior femora equal to the median segment and first and second abdominal segments in length, superior margin trilobate, the third low and subobsolete in character; tibiæ slightly shorter than the femora in length; metatarsi as in the median limbs.

General color ochraceous and wood-brown, the two tints irregularly intermingled, and distinctly contrasted in but few places.

Measurements.

Total length,	44 mm.
Length of pronotum,	3 "
Length of mesonotum,	9.1 "

Measurements.

Length of metanotum (including median segment),	6	mm.
Length of abdomen,	21.5	"
Length of anterior femora,	7	"
Length of anterior tibiæ,	5.8	"
Length of median femora,	6	"
Length of posterior femora,	7	"

Subfamily ANISOMORPHINÆ.

Genus **DECIDIA** Stål.

— 1875. *Decidia* Stål, Recensio Orthopterorum, III, pp. 57 and 96.

Type.—*Phasma soranus* Westwood.

Decidia soranus (Westwood)?

1859. *Phasma Soranus* Westwood, Cat. Orth. Ins. Brit. Mus., I, p. 127, Pl. XVII, fig. 3. ["In Colombiæ regione frigida Quindensi."]

One immature female; La Paz, Bolivia. [A. N. S. Phila.]

This specimen shows rudiments of the tegmina and wings, and while resembling Westwood's figure of *soranus* very closely in general appearance, it is much smaller (*circa* 45 mm.) than even the immature condition of the specimen would seem to warrant. The metatarsi are much shorter than in the figure of *soranus*, and the probabilities are that mature Bolivian specimens will show the existence of a form distinct from the type species.

Subfamily PSEUDOPHASMINÆ.⁴⁰Genus **STRATOCLES** Stål.

1875. *Stratocles* Stål, Recensio Orthopterorum, III, pp. 57 and 96.

Type.—*Stratocles cincipies* Stål.

Stratocles multilineatus n. sp.

Type.—♂; San Carlos, Costa Rica. (Schild and Burgdorf.) [Cat. No. 7,347, U. S. N. M.]

Near *S. forcipatus* Bolivar,⁴¹ with which it agrees fairly well in general measurements, but is separated by a number of other characters. Some slight resemblance appears to exist to the insufficiently described *Phasma bennettii* Gray.

Size small; form moderately elongate. Head slightly depressed, subequal in width; ocelli large; eyes ovate, prominent; antennæ somewhat exceeding the body in length, basal joint subquadrate, second joint cylindrical, equal to the basal joint in length. Pronotum

⁴⁰ I have followed Kirby (*Trans. Linn. Soc. London*, n. ser., VI, pp. 473-474) in using this name for the *Phasmidæ* of Brunner.

⁴¹ *Actas Soc. Espan. Hist. Nat.*, XXV, p. 11.

equal to the head in length, longitudinal, subequal except for a slight anterior constriction; anterior and posterior margins subtruncate; cruciform longitudinal and transverse striae finely marked, but distinctly visible; anterior angles rotundato-emarginate; posterior half with four more or less distinct raised longitudinal ridges. Mesonotum slightly longer than the pronotum, longitudinal, subequal in width, posterior portion considerably but gradually inflated, surface with four longitudinal rows of small tubercles, which posteriorly fuse into rough ridges; mesopleura smooth, with a longitudinal low ridge; mesosternum smooth, rounded. Metanotum twice as long as the mesonotum; metasternum plane. Tegmina ovoid, not half the length of the metathorax, discoidal protuberance rather sharp, longitudinal; apex rather narrowly rounded. Wings large, reaching to the apex of the seventh abdominal segment, slightly over twice as long as wide. Abdomen about half again as long as the head and thorax; the six basal segments longitudinal, gradually decreasing in length toward the apex; seventh dorsal segment transverse, not quite half the length of the sixth; eighth segment about twice the length of the seventh, very much inflated apically; ninth dorsal segment bullate, bearing a shallow median depressed area which gives the plate a bimammillate appearance, apical margin subtruncate; cerci not quite equal to the ninth dorsal segment in length, subequal and slightly depressed basally, acuminate apically; subgenital opercule but slightly shorter than the eighth dorsal segment, and exceeding the apical margin of the same, apical margin evenly rounded with a very slight shallow median emargination. Limbs very slender, the anterior and posterior femora subequal to their respective femora in length. Anterior femora slightly exceeding the entire thorax in length, basal flexure hardly visible; metatarsi very slightly shorter than the remaining tarsal joints. Median femora equal to the mesonotum and metathorax in length; tibiae somewhat shorter than the femora; metatarsi slightly shorter than the remaining joints of the tarsi. Posterior femora reaching slightly beyond the apex of the fourth abdominal segment; metatarsi slightly shorter than the remaining tarsal joints.

General color of the upper surface slate-black lined and spotted with emerald-green; head with seven distinct longitudinal lines; pronotum with two large irregular blotches on the anterior half, four longitudinal lines on the posterior part, and the entire margins of the same green tint; mesonotum with the lateral ridges and the four distinct rows of tubercles of the overlying tint; tegmina with the basic color solid except in the discoidal and basal regions which are ochraceous-rufous, veins of

the costal and posterior fields emerald-green; wings with the costal and discoidal of the same color scheme as the tegmina, posterior field smoky-hyaline, the veins distinctly blackish, the basal portion whitish; abdomen with the upper surface blackish, touched with ochraceous toward the apex. Under surface pale ochraceous, touched with reddish anteriorly and posteriorly. Antennæ blackish with very minute whitish annuli at the apex of each segment, the terminal joint ochraceous-rufous; eyes mottled wood-brown. Limbs with the femora blackish, lined along the carinæ with emerald-green, the proximal portion with the latter color predominating; tibiæ dull blackish-ochraceous; tarsi ochraceous.

Measurements.

Total length,	46 mm.
Length of pronotum,	3 "
Length of mesonotum,	3.7 "
Length of metathorax,	7.8 "
Length of tegmina,	4.5 "
Length of wings,	29.5 "
Length of abdomen,	29 "
Length of anterior femora,	15 "
Length of anterior tibiæ,	14.5 "
Length of median femora,	12.5 "
Length of posterior femora,	15.5 "

***Stratocles costaricensis* n. sp.**

Type.—♀; Costa Rica. (Schild and Burgdorf.) [Cat. No. 7,346, U. S. N. M.]

Apparently related to *Phasma perspicillare* Stoll,⁴² from which it differs in the longer limbs and rather different color pattern, which, however, resembles *perspicillaris* closer than any other species.

Size medium; form elongate subfusiform; surface generally velutinous and evenly pilose on the pronotum, mesonotum, limbs and ventral surface. Head suborbicular when viewed from the dorsum, considerably broader than the pronotum; occiput rounded; ocelli of medium size; eyes ovate, moderately prominent; antennæ exceeding the body by over half the length of the latter. Pronotum longitudinal, about twice as long as wide, subequal; anterior and posterior margins subtruncate; crueiform depression very slight. Mesonotum shorter than the pronotum, posterior half sharply yet evenly elevated, width subequal and slightly narrower than the pronotum. Metathorax considerably longer than the prothorax and mesothorax; metasternum plane. Tegmina rather short, irregularly elongate-ovate; costal area large and

⁴² *Natuurl. Afbeeld. Besch., Spoken*, pp. 67 and 77, Pl. XXIII, fig. 86.

distinctly emarginate apically; discoidal area with the tubercles compressed, longitudinal, triangular in outline. Wings ample, reaching to the apex of the abdomen in repose, almost twice as long as broad; apex rather narrowly rounded. Abdomen with the six basal segments longitudinal, decreasing in size toward the apex; seventh and eighth dorsal segments each about three-fourths the length of the sixth segment, tectate; ninth segment tectate, slightly shorter than the preceding segment, apex obtuse with a slight median emargination exposing the triangular apex of the supra-anal plate; cerci slender, simple, extending but a slight distance beyond the tip of the ninth segment; subgenital opercule large, cymbiform, extending to the apex of the ninth dorsal segment, apex produced, rectangulate. Limbs moderately slender. Anterior femora injured; tibiæ somewhat shorter than the thorax; metatarsi shorter than the remaining tarsal joints. Median femora equal to the mesothorax and metathorax in length; tibiæ distinctly shorter than the femora; metatarsi about two-thirds the length of the remaining tarsal joints. Posterior femora equal to the four basal segments of the abdomen; tibiæ equal to the femora in length; metatarsi equal to the remaining tarsal joints in length.

General color dull black, becoming brownish-black on the abdomen and limbs; mesonotum, mesopleura, mesosternum, metapleura and metasternum with several obscure lines of dull ochraceous. Femora each with several very obscure annuli of dull ochraceous. Tegmina ochre-yellow, suffused on the apical portion of the discoidal and posterior fields with pale glaucous-green; longitudinal veins of the discoidal and posterior fields apically, and the posterior margin entirely lined with black. Wings with the costal and discoidal regions pale ochre-yellow, fading into pale glaucous-green apically; anterior margin, a spot before the base and the veins of the discoidal area blackish; posterior field with the disk very pale clay color, the periphery and apex dark smoky-hyaline.

Measurements.

Total length,	52.2 mm.
Length of pronotum,	3.7 "
Length of mesonotum,	3 "
Length of metathorax,	9 "
Length of tegmina,	6.7 "
Length of wings,	39 "
Length of abdomen,	31 "
Length of anterior tibiæ,	16.5 "
Length of median femora,	13.1 "
Length of posterior femora,	18 "

Genus **PSEUDOPHASMA** Kirby (*Phasma* Auct.).⁴³

1896. *Pseudophasma* Kirby, Trans. Linn. Soc. London, 2d ser., VI, p. 473.

Type.—*Gryllus necydaloides* Linnæus (= *phthisicus* Linnæus).

After examining the literature on the subject, I fully agree with Kirby as to the necessity of a new name for the *Phasma* of most authors.

Pseudophasma phæton n. sp.

Type.—♀; San Carlos, Costa Rica. (Schild and Burgdorf.) [Cat. No. 7,348, U. S. N. M.]

Closely related to *P. urazi* Bolivar⁴⁴ from the Rio Atalapo, but differing in the hyaline posterior field of the wings, the longer mesonotum, and the different proportions of the limbs.

Bolivar's *P. perezi*⁴⁵ from Coea, Ecuador, also appears to be an allied species.

Size rather large; form very slender and elongate. Head considerably longer than the pronotum, very slightly constricted posteriorly; eyes ovate; antennæ with each joint somewhat thickened apically, basal joint oblong, slightly depressed. Pronotum not quite half the length of the mesonotum, almost twice as long as broad, subequal, anterior and posterior margins subtruncate; anterior angles with a slight emargination caused by a distinct spiraculous aperture; cruciform depression slightly marked. Mesonotum rather elongate, subequal in width; lateral margins each with a distinct longitudinal carina; median portion with a constant slight longitudinal sulcus; surface of the anterior three-fifths sprinkled with rounded tubercles, surface of the posterior two-fifths smooth; mesosternum obscurely tuberculate with a distinct, though irregular, longitudinal carina. Metathorax equal to the mesothorax in length; metasternum strongly longitudinal, and bearing a distinct, but very narrow, median sulcus. Tegmina slightly over three-fourths the length of the mesonotum, subrectangular, the apical margin obliquely truncate; costal margin arcuate; anal margin

⁴³ The name *Pseudophasma* was proposed almost simultaneously by both Kirby and Bolivar, the former to replace *Phasma* of authors, the latter to designate a new genus near to the one Kirby renamed. Considerable trouble was experienced in ascertaining the exact dates of the respective papers. Kirby's article (*supra*, pp. 447-475) was read December 5, 1895, and in the contents of the volume the date July, 1896, is given. Bolivar's paper (*Actas Soc. Espan. Hist. Nat.*, XXV, pp. 11-18) was presented January 8, 1896, and the date of publication of the part is given on the cover sheet as September 30, 1896. From the *Zoologischer Anzeiger* (*Bibliographia Zoologica*, I, pp. 552 and 650) we learn that Kirby's paper was received first, and this no doubt has priority of a month at least. Accordingly Bolivar's *Pseudophasma* requires another name, and I propose *Ignacia*, as a slight tribute to the worth of a master mind.

⁴⁴ *Actas Soc. Espan. Hist. Nat.*, XXV, p. 13.

⁴⁵ *An. Soc. Espan. Hist. Nat.*, X, p. 479.

straight; median tubercle elongate and relatively low; venation, except for the principal longitudinal veins, irregularly reticulate. Wings reaching to the middle of the fifth abdominal segment, slightly less than twice as long as broad; marginal costal field with the transverse veins irregularly disposed, all other cross veins (except those of the posterior field) regularly disposed. Abdomen with the six basal segments distinctly longitudinal, the sixth about two-thirds the length of the fifth; seventh segment about two-thirds the length of the sixth, and with the eighth and ninth strongly compressed and distinctly tectate; eighth and ninth segments subequal in length, the latter with the apical margin truncate; cerci equal to the ninth dorsal segment in length, elongate fusiform; subgenital opercule slender, reaching to the middle of the ninth dorsal segment, apex very strongly acuminate. Limbs slender, and relatively small. Anterior femora equal to the head, pronotum and mesonotum in length; basal flexure distinct and occupying slightly more than the basal third; tibiæ equal to the femora in length. Median femora two-thirds the length of the anterior femora; tibiæ about three-fourths the length of the femora; metatarsi about half as long as the remaining tarsal joints. Posterior femora slightly exceeding the apex of the second abdominal segment; tibiæ about four-fifths the length of the femora; metatarsi about three-quarters the length of the remaining tarsal joints.

General color mars-brown, closely and almost uniformly sprinkled with minute specks of vandyke-brown. Head with a distinct post-ocular streak of ecru-drab, which is bordered superiorly and inferiorly by a line of blackish, genæ ecru-drab; eyes vandyke-brown; antennæ with each joint bearing a distinct apical blackish annulus. Pronotum with a few subobsolete blackish blotches. Mesonotum with the ground color of the anterior tuberculous portion dull cinnamon, several of the larger tubercles blackish, posterior smooth portion suffused with greenish-blue; lateral carinæ dull cinnamon bordered inferiorly by a line of blackish. Metapleura and metasternum dull whitish. Tegmina with an irregular longitudinal blackish line passing to the exterior of the median tubercle. Wings with the costal and discoidal fields of the general color; posterior field hyaline. Limbs irregularly and rather obscurely annulate with mummy-brown on a ground of wood-brown.

Measurements.

Total length,	79	mm.
Length of pronotum,	3.5	"
Length of mesonotum,	9	"
Length of metathorax,	11	"

Measurements.

Length of tegmina,	6.5 mm.
Length of wings,	48 "
Length of abdomen,	49.5 "
Length of anterior femora,	15 "
Length of anterior tibiæ,	15.5 "
Length of median femora,	11 "
Length of posterior femora,	16 "

***Pseudophasma phthisicum* (Linnæus)?**

1758. [*Gryllus* (*Mantis*)] *phthisicus* Linnæus, Syst. Nat., X ed., p. 425.
["In Indiis."]

One male; Carrillo, Costa Rica. [Coll. Morgan Hebard.]

This specimen appears to be referable to this species, though differing considerably in coloration from the descriptions. The S-shaped mark on the tegmina is but little curved, while the posterior part of the tegmina is as black as the general color of the insect. The wings also carry a longitudinal dull ochraceous line along the greater portion of the discoidal region, in continuation of the median line on the tegmina.

The following measurements may be of interest:

Total length,	55.5 mm.
Length of pronotum,	4 "
Length of mesonotum,	4.7 "
Length of metathorax,	9.1 "
Length of tegmina,	6.5 "
Length of wings,	38.5 "
Length of abdomen,	33 "
Length of anterior femora,	17.5 "
Length of anterior tibiæ,	17.5 "
Length of median femora,	15.8 "
Length of posterior femora,	20 "

***Pseudophasma menius* (Westwood).**

1859. *Phasma Menius* Westwood, Cat. Orth. Ins. Brit. Mus., I, p. 118, Pl. XVII, fig. 2. [Colombia.]

Twelve specimens, all males; Carrillo, Costa Rica. [Coll. Morgan Hebard.] Carrillo and San Carlos, Costa Rica. (Schild and Burgdorf.) [U. S. N. M.]

This series ranges from mars-brown to seal-brown in general color, while the posterior field of the wings shows all intermediates between ceru-drab and cinnamon. Size, according to the series examined, appears to be subject to but little variation. Stål⁴⁶ has recorded this species from Chiriqui, and Griffini⁴⁷ has mentioned a female specimen

⁴⁶ *Revisio Orthopterorum*, III, p. 97.

⁴⁷ *Bollet. Mus. Zool. Anat. Comp.*, Torino, XI, No. 236, p. 2.

from the vicinity of the Rio Cianati, Darien, localities which connect those above mentioned and that of the type.

*Pseudophasma cryptochlore*⁴⁸ n. sp.

Type.—♂; San Carlos, Costa Rica. (Schild and Burgdorf.) [Cat. No. 7,349, U. S. N. M.]

Apparently closely allied to *P. gambrisius* (Westwood),⁴⁹ from Venezuela, but differing in the structure of the apex of the abdomen, the shorter mesonotum and quite different coloration. Relationship also exists with *prasinum* (Serville) and *pholcus* (Westwood).

Size small; form slender. Head slightly longitudinal, subequal, considerably wider than the pronotum; occiput with several fine longitudinal lines; ocelli very distinct, the anterior one considerably in advance of the others; eyes subglobose, very prominent; antennae equal to the body in length, first and second joint cylindrical, the latter considerably smaller and shorter than the basal joint, third joint equal to the fourth and fifth together. Pronotum about two-thirds the length of the mesonotum; anterior and posterior margins subtruncate; cruciform impression slight, the transverse arm toward the lateral margins deflected posteriorly; anterior angles normal though spiraculiferous. Mesonotum rather short and slender, slightly and evenly constricted toward the middle; surface sparsely granulate; median longitudinal sulcus slight but distinct; mesosternum rugulose with a distinct, though somewhat irregular, median carina. Metathorax about equal to the prothorax and mesothorax in length, beneath with a slight median sulcus. Tegmina not more than half the length of the metathorax, ovate; median tubercle low and somewhat elongate; longitudinal veins rather regularly disposed, transverse veins irregularly placed and producing a reticulate effect. Wings almost equal to the body in length, twice as long as broad; costal area with the transverse veins rather regularly disposed. Abdomen with the six basal segments longitudinal, very gradually decreasing in size toward the apex; seventh and eighth segments subequal in length, each shorter than the sixth; ninth segment rather shorter than the eighth, apically subtruncate; cerci rather short, terete, slightly curved; subgenital opercule slightly exceeding the apex of the eighth dorsal segment, cymbiform, the margin rounded, but developed into a distinct lip or rim. Limbs of moderate length, the anterior and median femora considerably exceeding their respective tibiae in length. Anterior femora equal to the pronotum,

⁴⁸ κρυπτος, *hidden*, and γλωρος, *green*, in allusion to the green of the ventral surface.

⁴⁹ *Catal. Orth. Ins. Brit. Mus.*, I, p. 118, Pl. XIV, fig. 2.

mesonotum and tegmina in length; metatarsi slightly shorter than the remaining tarsal joints in length. Median femora about equal to the pronotum and mesonotum in length; metatarsi equal to the three succeeding joints in length. Posterior femora not quite reaching the apex of the third abdominal segment; tibiæ slightly shorter than the femora; metatarsi about equal to the remaining tarsal joints in length.

General color above dull blackish; eyes umber; ocelli dull luteous; antennæ blackish, toward the apex bearing two broad annuli of obscure whitish, which is almost entirely due to the silvery pubescence. Tegmina with the principal longitudinal veins lined with pale greenish; wings with the costal and discoidal areas blackish, the longitudinal veins of the lateral regions lined with apple-green, posterior field of the wings blackish-hyaline, clear whitish basally, the area of the latter tint being comparatively small. Abdomen blackish, becoming dull brownish on the anterior portion of the ventral surface. Ventral and pleural surfaces of the thoracic segments apple-green. Limbs apple-green with the distal portion of each joint blackish, this color on the anterior limbs being very extensive and considerably limiting the greenish area.

Measurements.

Total length,	40 mm.
Length of pronotum,	2.5 "
Length of mesonotum,	4 "
Length of metathorax,	6.1 "
Length of tegmina,	3.5 "
Length of wings,	28 "
Length of abdomen,	25.5 "
Length of anterior femora,	10.5 "
Length of anterior tibiæ,	7 "
Length of median femora,	6.5 "
Length of posterior femora,	10 "

A paratype male has also been examined.

***Pseudophasma cyllarus* (Westwood).**

1859. *Necrosia Cyllarus* Westwood, Catal. Orth. Ins. Brit. Mus., I, p. 155, Pl. XIII, fig. 2, Pl. XIV, fig. 5. [Jamaica.]

One male; Kingston, Jamaica. (T. D. A. Cockerell.) [U. S. N. M.]

This species falls quite naturally into this genus, but that it is very aberrant there can be no doubt.

Genus **PLANUDES** Stål.

1875. *Planudes* Stål, Recensio Orthopterorum, III, pp. 59 and 98.

Type.—*P. perillus* Stål.

Planudes crenulipes n. sp.

Type.—♀: Tucurrique, Costa Rica. (Schild and Burgdorf.) [Cat. No. 7,350, U. S. N. M.]

Allied to *P. paxillus* (Westwood)⁵⁰ and *P. perillus* Stål.⁵¹ From the former it differs in the absence of distinct spines on the head, the more ovate tegmina, the much longer wings, the slightly longer mesonotum and the lobate posterior femora. From the latter it differs in the larger tegmina and wings, the rather different coloration of the wings, the smaller size, and apparently in the lobate posterior femora, although Stål does not state the condition of the limbs in the specimen examined.

Size medium; form elongate; surface rugoso-tuberculate. Head longitudinal, equal in width and not broader than the pronotum; occiput with the tubercles rather low and grouped into longitudinal series, the median pair of which diverge posteriorly; eyes globose, rather small, prominent; antennæ slightly exceeding the head and thorax in length, basal joint rather oblong, slightly depressed. Pronotum slightly longer than the head, subequal; anterior and posterior margins truncate; tubercles of even size, disposed in distinct longitudinal series; longitudinal sulcus very slight, transverse sulcus broad and shallow, but very marked. Mesonotum slightly over twice the length of the pronotum, gradually expanding posteriorly, surface rugoso-tuberculate; metapleura finely rugulose; metasternum with an irregular median longitudinal carina. Metathorax about as long as the mesothorax, rather sparsely tuberculate. Tegmina elliptical; veins irregularly reticulate; median protuberance high, blunt, the posterior portion curved inward toward the anal margin. Wings four times as long as the tegmina, reaching to the middle of the fourth abdominal segment, not quite twice as long as wide; venation rather regular proximally becoming subreticulate distally. Abdomen over half again as long as the head and thorax, the six basal segments longitudinal, the first and second shorter than the succeeding divisions; seventh segment subquadrate; eighth and ninth segments distinctly transverse, the latter shorter than the former, and with the apical margin subtruncate and distinctly crenulate; cerci very short, slight and simple, lateral in position; subgenital opercule short, reaching the apex of the seventh dorsal segment, carinate, apex acuminate. Limbs short. Anterior femora about equal to the mesonotum in length, margins crenulate; tibiæ slightly shorter than the femora, margins crenulate; metatarsi not more than half as long as the remaining tarsal joints. Median femora

⁵⁰ *Catal. Orth. Ins. Brit. Mus.*, I, p. 127, Pl. XI, fig. 5.

⁵¹ *Rec. Orthopt.*, III, p. 98.

slightly shorter than the anterior tibiæ in length, margins very slightly crenulate; tibiæ slightly over two-thirds the length of the mesonotum, margins moderately and irregularly crenulate; metatarsi less than half the length of the remaining tarsal joints. Posterior femora about equal to the mesonotum in length, superior margins dentato-crenulate, the anterior one with the processes very large, inferior margins with distinct rounded foliaceous lobes; tibiæ slightly shorter than the femora, the superior margins with distinct hemispherical lobes; metatarsi about half as long as the remaining tarsal joints.

General color olive, irregularly blotched and sprinkled with patches of wood-brown and bearing a very pale suffusion of pea-green on the wings and tegmina. Wings with the base of the costal and the whole discoidal area suffused with a wash of vinaceous pink; posterior area pale smoky-hyaline, the veins pale brownish, the whole surface bearing an indefinable bloom of pinkish vinaceous, best seen by viewing the wing obliquely.

Measurements.

Total length,	63	mm.
Length of pronotum,	4	“
Length of mesonotum,	8	“
Length of metathorax,	8.5	“
Length of tegmina,	7	“
Length of wings,	26	“
Length of abdomen,	40	“
Length of anterior femora,	9.5	“
Length of anterior tibiæ,	8.5	“
Length of median femora,	7	“
Length of posterior femora,	8	“

Genus **XEROSOMA** Serville.

1831. *Xerosoma* Serville, Ann. Sci. Nat., XXII, p. 61.

Type.—*Xerosoma canaliculatum* Serville.

Xerosoma glyptomerion⁵² n. sp.

Types.—♂; San Carlos, Costa Rica. (Schild and Burgdorf.) [Cat. No. 7,351. U. S. N. M.] ♀; Carrillo, Costa Rica. [A. N. S. Phila., presented by Mr. Morgan Hebard.]

Apparently closer allied to *sentiosa* Stål⁵³ than any other member of the genus, but still very distinct. It can readily be separated by the absence of distinct spines on the pronotum, the greater number of cephalic spines, the shorter mesonotum of the female and a number of other characters.

⁵² γλυπτωτός, *sculptured*, and μῆριον, *thigh*.

⁵³ *Reccensio Orthopterorum*, III, p. 99.

♂.—Size rather small; form elongate; surface generally rugulose. Head moderately elongate, subequal; occiput with four distinct spiniform processes; interocular region with three triangularly disposed rather blunt processes, the anterior one smaller than the other two, and bearing upon their summits the ocelli; eyes subglobose, very prominent; antennæ equal to the body in length, first and second joint about equal in length, the basal joint somewhat depressed; whole surface with a number of evenly distributed spiniform tubercles. Pronotum about equal to the head in length, rather narrower than the head, subequal in width, anterior angles with a slight projecting process; anterior and posterior margins truncate; cruciform depression with the transverse arm stronger than the longitudinal branch. Mesonotum about twice the length of the pronotum, subequal in width, somewhat elevated posteriorly; median longitudinal sulcus very distinct posteriorly, obsolete anteriorly; surface rugoso-tuberculate, four spiniform symmetrically disposed tubercles flank the median line; mesosternum rugose. Metathorax about equal to the pronotum and mesonotum in length, metapleura and the metasternum sparsely and weakly tuberculate. Tegmina about equal to the metathorax in length, cylindrical-ovate in outline, the base and apex produced and angulate; median protuberance very distinct, high, rounded, compressed; veins subreticulate, surface rather coriaceous. Wings extending to the middle of the sixth abdominal segment, twice as long as broad; apex subrectangulate. Abdomen with the six basal segments longitudinal, decreasing in length distally; seventh dorsal segment two-thirds the length of the sixth; eighth segment considerably shorter than, and ninth about equal to, the seventh segment, the latter compressed, subrostrate and with the apical margin with a shallow median V-shaped emargination; cerci slender, straight and equal to the ninth dorsal segment in length; subgenital opercule slightly exceeding the apical margin of the eighth dorsal segment, basally bullate, apical portion compressed, rather rostrate, the apex itself with a shallow triangular emargination. Limbs slender and simple; tibiæ about equal to their respective femora in length. Anterior femora equal to the tegmina, mesonotum and half of the pronotum in length, basal flexure marked; metatarsi slightly shorter than the remaining tarsal joints. Median femora about equal to the pronotum and mesonotum in length; metatarsi slightly shorter than the remaining tarsal joints. Posterior femora reaching to the middle of the third abdominal segment; metatarsi very slightly shorter than the succeeding joints.

General color dull paris-green and prout's-brown intermingled.

Head with the spines clear green; eyes walnut-brown; antennæ greenish, each segment with a narrow apical annulus of brown. Mesonotum with the larger spines tipped with clear brown. Tegmina with the median protuberances clear green. Wings with the costal and discoidal regions bearing strongly contrasted blotches of the two colors washed with an ochraceous tint; posterior field smoky-hyaline. Limbs with the usual coloration, but the tibiæ have the green clear and vitreous.

♀.—Size medium; form moderately elongate; surface rugoso-tuberculate. Head somewhat longitudinal, subequal in width; occiput bearing about twelve formidable spines ranged in four longitudinal series, of which the median pair contain the greatest number of spines and the posterior ones of which are recurved and considerably larger than any of the others; interocular region with the ocellar spines much reduced, the anterior one practically obsolete, the ocellus but slightly raised above the surrounding surface; eyes subglobose, moderately prominent; antennæ with the basal joint strongly depressed; entire dorsal surface sprinkled with small spiniform tubercles. Pronotum slightly shorter than the head, very strongly emarginate over the anterior coxæ; anterior margin broadly and evenly emarginate, posterior margin truncate; median line flanked by a longitudinal row of several short spines. Mesonotum not quite twice the length of the pronotum, subequal in width; no median carina or sulcus present; surface strongly rugoso-tuberculate; mesopleuræ and mesosternum rugoso-tuberculate, the lower margins of the former and the lateral borders of the latter bearing distinct tuberculous ridges. Metathorax slightly longer than the other thoracic segments together; metasternum obsolete tuberculate; metapleuræ bearing along their lower margins a series of four distinct rounded tubercles. Tegmina equal to the head, pronotum and mesonotum in length, elongate-elliptical; apex narrowly rounded; tubercle placed distinctly anterior to the middle, high, rounded, compressed; surface coriaceous, subreticulate, and bearing a number of small node-like projections. Wings about equal to the abdomen in length; costal and discoidal areas with the transverse nervures rather regular in character. Abdomen depressed, each segment with the lateral margins developed into a more or less crenulate foliaceous flap; the five basal segments longitudinal, the fifth broader than the others; sixth segment quadrate; seventh, eighth and ninth segments transverse, decreasing in length distally, median carina present on the seventh and represented by two parallel ridges on the eighth, ninth segment crenulato-truncate; cerci slender, almost equal to the ninth dorsal segment in length, apex blunt; subgenital opercule rather short,

reaching to the middle of the eighth dorsal segment, V-shaped in section, the apex subtruncate with a triangular median projection. Limbs rather short;⁵⁴ tibiae about equal to their respective femora in length; femora with nearly all their carinae bearing distinct subdentiform lobes, those of the superior carinae being the more prominent; tibiae with superior margins only bearing such lobes. Anterior femora almost equal to the tegmina in length, basal flexure distinct and strongly bowed, superior external margin bearing five lobes,⁵⁵ superior internal margin four lobes, the inferior internal margin none, the inferior external margin ten; tibiae bearing four very large and distinct lobes on the external margin, internal margin with four smaller lobes placed in juxtaposition to those of the external margin; metatarsi considerably shorter than the remaining tarsal joints, and bearing several small jagged lobes on its superior surface. Median femora equal to the mesonotum and half of the metanotum in length, superior margins with five lobes placed in juxtaposition, inferior margins with four distinct lobes placed as on the superior carinae, median carina of the lower surface with several obsolete lobes; tibiae with five more or less distinct lobes placed as on the anterior limbs; metatarsi not exceeding the second and third tarsal joints in length, unarmed.

General color olive and drab, intermingled and suffused on the head, portions of the thorax and anterior limbs with very pale cinnamon. Eyes walnut-brown. Tegmina pale paris-green, which becomes rather clear and subvitreous on the protuberances.

Measurements.

	♂	♀
Total length,	54 mm.	65 mm.
Length of pronotum,	2.6 "	3 "
Length of mesonotum,	6.2 "	6.5 "
Length of metanotum,	8.1 "	11 "
Length of tegmina,	8 "	14 "
Length of wings,	33 "	50 "
Length of abdomen,	33 "	49 "
Length of anterior femora,	14.5 "	13 "
Length of anterior tibiae,	14.5 "	12 "
Length of median femora,	8.5 "	8 "
Length of posterior femora,	12 "	

Further study may possibly show that the two sexes here described as one species represent two forms. In such a case the name can be restricted to the male.

⁵⁴ Posterior pair missing in the type.

⁵⁵ As the left leg appears abnormal in a number of ways, these figures have been taken from the right limb.

Genus **METRIOTES** Westwood.

1859. *Metriotes* Westwood, Catal. Orth. Ins. Brit. Mus., I, p. 158.

Type.—*Mctriotes diocles* Westwood.⁵⁶

Metriotes agathocles Stål.

1875. *M[etriotes] Agathocles* Stål, Recensio Orthopterorum, III, p. 100.
[“Australia? Sine dubio species americana.”]

One female; Costa Rica. (Schild and Burgdorf.) [U. S. N. M.]

This specimen fully agrees with the very insufficient description of the specimen Stål had in hand, but unfortunately the anterior limbs are missing, and a portion of Stål's diagnosis treats of these appendages.

Genus **PRISOPUS** St. Fargeau and Serville.

1825. *Prisopus* St. Fargeau and Serville, Encyc. Method., Insect., X, p. 444.

Included *Prisopus draco* Olivier (= *Phasma nympha* Stoll) and *sacratu*s Olivier (= *Phasma flabelliformis* Stoll).

Prisopus berosus Westwood.

1859. *Prisopus Berosus* Westwood, Catal. Orth. Ins. Brit. Mus., I, p. 168,
Pl. XX, fig. 7. [“Litt. occid. Americæ septentrionalis. Panama.”]

Two specimens; ♂ and immature female; Nicaragua. [U. S. N. M.]
Carrillo, Costa Rica. [Coll. Morgan Hebard.]

Subfamily PHYLLINÆ.

Genus **PHYLLIUM** Illiger.

1798. *Phyllium* Illiger, Verzeichniss Käfer Preussens, p. 499.

Type.—*Mantis siccifolia* Fabricius = *Gryllus (Mantis) siccifolius* Linnæus.

The three species treated below all belong to Griffini's subgenus *Pulchriphyllium*.⁵⁷

⁵⁶ Westwood's genus included the following species:

stollii.
blanchardi.
santara—*Isagoras* Stål, 1875.
bubastes—*Isagoras* Stål, 1875.
obscura—*Isagoras* Stål, 1875.
dictys—*Prexaspes* Stål, 1875.
myrsilus.
diocles.
venosa.
acuticornis.
servillei—*Prexaspes* Stål, 1875.
brevipennis.
rugicollis.

Of these *diocles* can be selected as the type.

⁵⁷ *Bollettino Musei Zool. ed Anat. Comp.*, Torino, XIII, No. 312, p. 2.

Phyllium bioculatum Gray.

1832. [*Phyllium*] *bioculatum* Gray, in Griffith's Anim. Kingdom, XV, p. 191, Pl. 63, fig. 3. [Locality unknown.]

One female; Seychelles. (Dr. W. L. Abbott.) [U. S. N. M.]

This specimen is of a very pale yellowish-green color.

Westwood⁵⁸ states regarding this species that the "male seems to me scarcely to differ materially from that of *Ph. Scythe*." Such is by no means true of the female, as this sex of the two species presents very different appearances.

Phyllium pulchrifolium Serville.

1839. *Phyllium pulchrifolium* Serville, Orthoptères, p. 292. [Java.]

Three specimens; two adult females, one immature male:

Java. [A. N. S. Phila.]

Near Buitenzorg, Java, July, 1897. (D. G. Fairchild.) [U. S. N. M.]

"Collected on leaves of *Nephelium lappaceum*."

The female from Buitenzorg has the tegmina and limbs wood-brown, while the body is faded greenish. Information with the specimen states the color is due to imperfect drying. While this is quite likely true of the body, it is hardly probable that the tegmina have changed. In the event of the specimen having possessed brown tegmina, it would approach the brown variety described by Lucas⁵⁹ from Batavia.

Phyllium scythe Gray.

1843. *Phyllium Scythe* Gray, Zoologist, I, p. 122, figure (on page 121). [Sylhet.]

One female; Trong, Lower Siam. (Dr. W. L. Abbott.) [U. S. N. M.]

This specimen differs slightly from the figure given by Westwood,⁶⁰ the apex of the abdomen being more constricted, in fact somewhat approaching *pulchrifolium* in this respect. After carefully examining the literature, it appears very much as if the *scythe* and *pulchrifolium* were simply geographic races of the same species, the Trong specimen being a direct intermediate, both structurally and geographically. Gray's reference of Haan's figure⁶¹ of *pulchrifolium* to *scythe* appears erroneous, as the form of the abdomen and almost all the accessory lobes of the limbs represent true *pulchrifolium*. The Trong specimen has the right posterior limb regenerated and about one-fifth the normal size.

⁵⁸ *Catal. Orth. Ins. Brit. Mus.*, I, p. 175.

⁵⁹ *Bull. Soc. Ent. France* (5), VII, p. xxxiii.

⁶⁰ *Catal. Orth. Ins. Brit. Mus.*, I, Pl. XXXI, fig. 2.

⁶¹ *Natuurl. Gesch. Nederl. Overzeesche Bezitt.*, Insecta, Pl. XV, fig. 6.

Another specimen, a very immature female, from Khow Sai Dow, Trong, collected in January or February, 1899, by Dr. Abbott, may be referable to this species, but considering the condition of the specimen a positive determination is impossible.

REMARKS ON THE GENERAL SYSTEM OF THE FAMILY.

While not prepared to bring forward any very radical departures from Brunner's table of the divisions of this group,⁶² it may not be out of place to mention the impressions received while studying the material herewith recorded. Brunner's *Lonchodidæ*, *Bacunculidæ* and *Bacteridæ* appear to be much closer related than his arrangement would lead one to suppose. The *Heteronemina* (*Bacunculidæ* Brunner) is very close to the *Bacterina*; in fact, it is extremely difficult to settle into which division to put certain genera, and this is so marked that Kirby has transferred some genera placed by Brunner in the *Bacunculidæ* to the *Bacterina*.

The genera *Phyllium* and *Chitoniscus* are such extremely aberrant types that the division including them should have higher taxonomic rank than generally accorded to it.

Laying aside the question as to whether the divisions should be of family or subfamily rank, it appears evident that Brunner's *Lonchodidæ*, *Bacunculidæ* and *Bacteridæ* are simply divisions of a group not exceeding in rank the well-marked *Necroscidæ*. Again, the *Phyllidæ* should have a rating practically equal to the other members of the "Phasmodea," a position warranted by its extreme differentiation.

⁶² *Ann. Mus. Civ. Stor. Nat. Genova*, XXXIII, pp. 79-81.